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PREFACE.

IT is generally considered a rash experiment to publish a second series of a book of which the first series was so far complete in itself. The author who does so is often considered to be presuming upon the kindness and the long-suffering of the public, or he is riding a hobby to death. The public sometimes resent this proceeding, and decline a second helping from the same dish. The present Author has fond hopes that a large number, if not all, of those who so rapidly caused the exhaustion of the first edition of the previous volume will feel how apposite to their case is the quotation we have already made from John Burroughs, the American writer on nature. We will repeat what we stated in the Preface to the First Series: that there are about seventeen hundred flowering plants and ferns indigenous to the British Isles, of which only four hundred could be dealt with in the First Series. It does not appear to us unreasonable to suppose that many ramblers who carry the First Series in their right-hand jacket-pocket will be glad to have a volume of similar size and purpose to put in the left-hand pocket, and so preserve the equilibrium.

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In most of the works on wild-flowers that have been designed for popular reading and the adornment of the drawing-room table, authors and artists have confined their work to the already well-known plants with showy blossoms. We have gone further afield, and in this Second Series especially have included a considerable number of the less conspicuous plants. The book probably loses in effect thereby, but we are sure its practical value is largely increased by leading the flower-lover to consider and understand some of the less assertive members of the British Flora.

As in the New Edition of the First Series, we have marked on the plates the approximate proportion the figure bears to the natural size of the plant depicted. The reader is warned that these figures must not be regarded too strictly; for plants are more subject to variation in size than in any other respect, according to the locality in which they are found, and the wetness or dryness of the season. A similar observation may be made respecting the flowering periods, which differ considerably in the southward and northward range of the species.

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INTRODUCTION.

A COMMON complaint made to botanists by unscientific flower-lovers refers to the difficulty of acquiring a knowledge of Botany. They fear a bogey in the shape of the dreadful words of Greek or Latin origin, and what they consider the involved system of classification into classes, orders, genera and species ; but, like most other bogies, this one is easily put to flight by a slight exhibition of courage. The white sheet spread across a post to frighten the timid turns out on close inspection to be a chart of the Vegetable Kingdom, making exploration easy, and the post itself is a guide-post! We do not suppose that our readers will experience any serious difficulty respecting the few, though oft-repeated, technical terms and the scientific names introduced in the two volumes of this work ; and if that is so, we may surely go so far as to counsel them to study some simple manual of structural botany, such as Sir J. D. Hooker's "Primer of Botany," published by Macmillan and Co. After such study, elementary though it be, they will find that not only the blossoms, but all other portions of the plant also, are full of interest. In truth, such rudimentary acquaintance with the *plant* as a whole—how it came to be, how it is built up, how it lives and grows and plays its part in the work of the universe—is really necessary before we can fully appreciate all the beauty of flower structure.

From the many references in these pages to the various methods by which cross-fertilisation is effected, the reader will have learned that the great differences of form and colour existing

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between flowers have a far more serious significance than the mere desire for variety. Gray in his famous "Elegy" wrote—

> "Full many a flower is born to blush unseen
> And waste its fragrance on the desert air."

In these lines Gray reflected the narrow view prevailing until quite recently, that the sole *raison d'être* of the flower's beauty and fragrance was that it might minister to man's pleasure; therefore, the flower that expanded where the eye of man could not behold it was wasted. Were he now living, Gray would almost certainly rewrite or expunge those lines, for it is now clear that the tastes of the nectar-seeking, pollen-carrying insects have had greater weight in the evolution of the flower than had man's æsthetic sense. Further, the fragrance of the desert flower we now know to be *primâ facie* evidence that insects also exist in that desert; and should the appropriate insect come to the flower and taste of its nectar, we know that the fragrance has not been wasted, though no human foot ever passed that way. Our increasing knowledge of the intimate relation between the forms of insects and the structure of the flowers they visit should furnish the poets with quite a new set of images.

In the First Series (2nd edition) of this work we have given a description of the parts of a flower, with a brief account of the principal kinds of flower-grouping (*inflorescence*); and our readers would not thank us for now traversing the same ground. It may be pointed out, however, that in most cases this grouping has been directly influenced by commerce between plant and insect. The smaller blossoms co-operate among themselves with the object of rendering them conspicuous, though individually they are insignificant. Most Umbelliferous plants, such as Wild Carrot, Fool's Parsley, Hogweed, have minute white or yellow flowers; yet by the simple expedient of mounting these flowers upon radiating footstalks of varying lengths, a hundred or more flowers are brought close together on a

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common level, and they thus form some of the most conspicuous flower-masses of our hedgerows. Here, too, the honey is so exposed on open disks that it is accessible to the short-tongued flies and small beetles, but in consequence cannot be obtained with ease by the long-tongued bees and butterflies. Hermann Müller found that of 118 species of insects visiting the flowers of Hogweed (*Heracleum sphondylium*) there was not a single butterfly or moth: there were 13 kinds of bees, 49 kinds of flies, and 56 species of beetles and other insects. His tabulation of the visitors to other species of Umbellifers gives similar results; but in the more compact flower-heads of Composite plants, with their longer tubular florets, the proportions are changed in favour of the long-tongued insects. Thus, of 93 species he noted as visitors to the Dandelion (*Taraxacum officinale*), 7 were butterflies or moths, 58 bees, 21 flies, and only 7 representatives of other orders. As we have shown in the following pages, there are flowers in which the honey can be reached only by insects with very long tongues; others only by short-tongued wasps. Bearing these points in mind, when the rambler comes across what may be to him a new flower, it will be in numberless cases no very difficult matter, after a careful examination of the corolla, and the relative positions of the anthers, stigma, and honey-secreting organs, to say, "This flower is most probably fertilized by a hawk-moth," a bee, a wasp or by various minute insects, as the case may be.

Such guesses as these, of course, imply a knowledge of insect form, and this the genuine lover of flowers will seek to obtain by observation at the same time he is seeking the blossoms. Botany and Entomology are intimately related at many points, and they are two branches of natural history that can be pleasantly and easily studied side by side. He will find that many flowers lay themselves out specially to attract the night-flying moths, and with this object in view they are most frequently pure white, and therefore very conspicuous. He

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will be particularly struck with this specialization when he considers the difference it makes between members of the same genus, where one adapts itself for diurnal, and another for nocturnal insects. *Lychnis diurna*, the common Red Campion, flowers by day, and its crimson corolla is conspicuous in the hedgerow. The very similar in form, White Campion (*L. vespertina*), opens its new flowers only in the evening, when it also becomes fragrant. Its flowers are pure white, and at night-time they appear almost luminous against the dark background of the field-hedge. So like are these two nearly related species that Linnæus associated them as two varietal forms of one species; and some modern botanists so regard them still.

But not only are plants specially adapted to encourage the visits of particular groups or even species of insects, and to profit by those visits; many of them take pains to exclude unprofitable insects of the smaller fry, who would simply steal honey or pollen without rendering any service in return. And so when Nature makes the tubular bell of Foxglove (*Digitalis purpurea*) just sufficiently large to enable a big bumble-bee to enter and well dust itself with pollen, she also takes care to plant a barrier of long hairs in the entrance which small insects cannot pass. The mechanical arrangements in the diverse, yet similar leguminous plants, in the Barberry, the Violet, and many Orchids, are all to be considered with an eye to their cross-fertilisation by insect agency. Should the reader come upon a plant whose flowers exhibit a peculiarity of structure, or some singular detail in which it strongly differs from others obviously related to it, he will almost certainly find, on carefully investigating the case, that some insect is "at the bottom of it." Then again, the period of opening and closing of the flower has relation to the time of day at which the pollen-carrying insect flies; the splashes and streaks of colour all run from the entrance of the flower towards the

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honey-glands to serve as guiding lines; the very manner in which a flower is hung might be similarly explained in many cases, probably in most or all, were our knowledge of the subject more perfect.

We believe that the specific instances we have given of these mutually profitable adaptations of plant and insect will serve to whet the appetite of the reader, and make him desirous of a deeper knowledge of what one may term the Newer Botany, and will set him more closely considering the growing plant before he plucks the flower. The too common notion of scientific Botany is that it is a matter of bundles of hay, labelled with barbarous and arbitrarily chosen names; but the notion is a wrong one. No doubt there are some botanists who attach greater importance to the study of herbarium specimens than to the observation of the growing plant; but, necessary as herbaria are as affording type specimens for examination at all seasons, the Botany of to-day is an outdoor science that has to do with living Nature, and the outdoor botanist is made acquainted with "fairy tales of science" no whit less wonderful or less interesting than the fairy tales of the astronomer, the geologist, the chemist, or the electrician.

We send forth this volume in the sincere hope that of many who will take it up simply with the object of identifying the common blossoms of the woodland and the wayside, some will find in its pages a few suggestions that may encourage them to proceed further, until they enter upon a serious study of the whole subject of plant life. As in Series I., we append an explanation of technicalities used in the following pages:—

Achene.—A fruit like a little nut; a single carpel containing a single seed.

Axil.—The angle between a stem and the upper side of a leaf-stalk. *Axillary.*—Growing in the axil.

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Bipinnate.—When *pinnæ* (*see* below) are themselves pinnate.

Bract.—A modified leaf beneath a flower or flower-cluster.

Bracteole.—A diminutive bract.

Cauline.—Leaves arising from a stem as contrasted with those (*Radical*) which spring directly from the rootstock.

Cladode.—A modified branch, resembling a leaf.

Compound.—A leaf broken up into several leaflets. *Decompound.*—The leaflets themselves similarly broken up.

Connate.—When the bases of the opposite leaves are grown together.

Digitate.—Leaflets distinct, radiating from the leaf-stalk.

Dicœcious.—When staminate and pistillate flowers are borne by different plants of a species.

Entire.—Having the margin undivided.

Follicle.—A dry one-celled and one-valved fruit containing more than one seed.

Genus.—An assemblage of *species* all agreeing in some important though minor structural character, and all bearing the same primary name. Plural, *genera.*

Glume.—A chaffy envelope containing the essential organs of grasses.

Involucre.—A series of bract-like leaves below a cluster of flowers. *Involucral.*—Pertaining to the Involucre.

Linear.—A leaf that is long and very narrow, with parallel sides.

Lyrate.—Deeply-lobed so that the outline is similar to that of a lyre reversed.

Monœcious.—Staminal and pistillate flowers produced by the same individual.

Node.—A joint of the stem.

Palmate.—Lobed in the form of a hand.

Pappus.—The calyx of Composite flowers; usually a whorl of bristles or silky hairs.

Pectinate.—Arranged like the teeth of a comb.

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Perfoliate.—When a stem passes through the base of a stalkless leaf.

Perigynium.—The floral envelope of a *Carex.*

Pinnate.—When the leaf is broken up into four or more distinct leaflets, arranged in two series along the midrib; as in the leaf of Hippocrepis (Plate 22). Each leaflet is called a *pinna;* plural *pinnæ.*

Pinnatifid.—When the leaf is deeply cut into a number of opposite lobes, which are connected with the midrib by the whole width of their bases. Example, Hard-fern (Plate 120).

Proterandrous.—When the stamens mature before the stigmas.

Proterogynous.—When the stigmas mature before the stamens.

Radical.—Leaves that arise directly from the rootstock, unconnected with stem or branch.

Scape.—A flower-stalk, usually leafless, arising directly from the rootstock.

Scarious.—Dry and translucent.

Sessile.—Connected with the stem without an intervening footstalk. Used both of leaves and flowers.

Simple.—An unbranched stem; an undivided leaf.

Spathe.—A large leafy bract enclosing a cluster of flowers.

Species.—Individuals bearing almost absolute likeness between themselves; varying only to a comparatively slight extent, possibly in size or colour.

Spreading.—When the petals of a flower open till they are at right angles with the central column they are spreading. Hairs standing out horizontally from a perpendicular stem are spreading.

Stipules.—Bract-like processes in pairs at the base of a leaf-stalk.

Terminal.—Flowers produced at the summit of a stem or end of a branch.

Vittæ.—The oil-tubes in the fruits of Umbelliferæ.

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WAYSIDE AND WOODLAND BLOSSOMS.

The Snowdrop (*Galanthus nivalis*).

IT is generally agreed among botanists that the Snowdrop is not indigenous to this country, although it is now found thoroughly naturalized and quite wild in orchards, copses, and meadows at intervals throughout the country. There is a suspicion, based on the conditions of its growth, that in Denbigh and Hereford it may be native. In some cases it is the sole memorial of the cottage that once stood within the wood or orchard, in whose garden a little clump of snowdrops was planted many long years ago. The walls of the cottage have fallen and been levelled, the people who lived in it forgotten save by one or two of the oldest folk. All the other garden plants have been killed out by the native weeds, but the Snowdrop alone has held her ground and spread over the whole enclosure, so that the people of the village often come, with trowel in hand, and remove a clump of the bulbs to their cottage gardens. May it spread still more in our land! We are never likely to regard it as a nuisance, as foreign plants taking too kindly to an adopted land are apt to become.

The Snowdrop belongs to the (in this country) little order of Amaryllids, having for company the Daffodil and the Snowflake. Its stem takes the form of a little brown bulb, "in size

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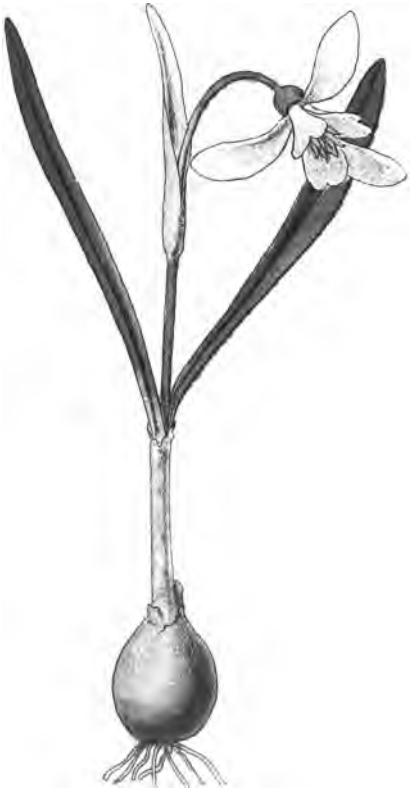

Snowdrop.
Galanthus nivalis.
— AMARYLLIDEÆ. —
Nat. size.

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no bigger than a hazel-nut," and from this appears, in the very earliest days of the year, often when the ground is covered with snow, a solitary pair of long, straight-sided (*linear*), narrow leaves, of glaucous or sea-green hue, and slightly keeled on the outer surface. A little later there comes up direct from the bulb a simple (that is, unbranched) flower-stem (*scape*), bearing a large bract, or spathe, from which issues the solitary flower on a thin bending stalk. The three spreading sepals are pure white, and the three smaller petals are also white, but with a patch of green near the notched upper edge of each. There are six stamens, and a slender style. The flower is honeyed and scented, and remains open from ten till four. The ovary is inferior. The flowering period is from January to March. The name of the genus is a compound of two Greek words, *gala*, milk, and *anthos*, flower = the milk-white flower. *Nivalis* is the Latin for snowy.

The Snowflakes, though constituting a separate genus (*Leucojum*), are very closely allied to *Galanthus*. There is, however, no distinction in form or size between petals or sepals, as in the Snowdrop; nor in colour, for each is pure white, with a small green patch near the tip. The flowers, too, instead of being solitary, are produced from the spathe in a cluster of from two to six. The leaves of *L. æstivum*, the Summer Snowflake, appear in the winter, but the flowers not till May; both flowers and leaves of the smaller *L. vernum*, or Spring Snowflake, appear about March. The latter species bears only one or two flowers. The name is Greek, signifying white-violet, from the words *leukos* and *ion*.

Setterwort (*Helleborus fœtidus*).

Ramblers in the chalk districts of Southern and Eastern England may come across this curious plant, though it is the reverse of common. It may be found also occasionally in other parts of the country, but only as a naturalized plant. The Setterwort, or Stinking Hellebore, is a coarse-growing perennial, its large radical leaves divided into a number (five or six) of narrow leaflets; those that occur on the upper part of the flowering stem are more or less reduced to the condition

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of bracts. The flowers are rather puzzling at first sight, for the large purple-bordered sepals quite hide the small tubular petals, which are shorter than the many stamens. The flowers never open widely, and so they assume a globular form; they are numerous, borne in a loose panicle, and their odour is fetid.

There is another British species, the Bear's-foot, or Green Hellebore (*H. viridis*), a smaller plant with fewer flowers, found in similar situations to the last. Its yellowish-green sepals are more spreading than those of *fœtidus*, and the flowers are less drooping than in that plant. Both flower from February to April, but *fœtidus* appears before *viridis*; both are highly poisonous.

The Spurge Laurel (*Daphne laureola*).

The Spurge Laurel must be looked for in the copse and wooded hedge, flowering from January to April, its bright evergreen leaves making it conspicuous at a period when there is little fresh-looking vegetation. It seldom exceeds three feet in stature, and is but slightly branched. The leaves are tough, leathery, oblong, sharp-pointed, and almost stalkless. The flowers are green and smooth, produced in small clusters (*cymes*) from the axils of the upper leaves. The flower is a tubular perianth, with four spreading lobes, there being no distinction between sepals and petals. There are eight short stamens attached to the tube in two series. In some of the flowers there is no style; in others of the same cluster it is present, but very short. The berries are bluish-black.

There is a second species, the Mezereon (*D. mezereum*), growing somewhat taller, but the leaves are not evergreen. Early in the year, about February, it puts forth its fragrant pink flowers before a leaf has appeared. The leaves are produced in tufts at the end of the erect branches, and the flowers originate just above the scars of last year's leaves. The

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Spurge Laurel.
Daphne laureola.
— THYMELEACEÆ. —
½ *nat. size.*

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Butcher's Broom.
Ruscus aculeatus.
— Liliaceæ. —
Nat size.

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berries of this species are bright red. Both plants are very poisonous.

The name *Daphne* is from the classical myth of the daughter of Terra and Peneus, who was changed into a laurel to escape the importunities of Apollo.

Butcher's Broom (*Ruscus aculeatus*).

Butcher's Broom has no showy flowers to advertise its presence, and it must, therefore, be searched for in its natural *habitats*—woods, copses, and under trees on commons in the south and west. It is so singular a plant that when found it is sure to interest the rambler. Popularly it is said to produce flowers from the middle of the leaf-blade; but this is not a correct statement, for things are not always what they seem. The seeming leaves are really modified branches (*cladodes*), the true leaves being reduced to minute scales at their bases.

Butcher's Broom, Knee Holly, Kneehulver, Kneeholm, or Pettigree belongs to the Lily order, although it is not a bulbous plant, but included with those species—such as Asparagus, Solomon's Seal, and Lily of the Valley—in which the stem springs from a thick, white, creeping rootstock with "eyes." From these suddenly arise the stems, which are first pale, almost white, and tender, in which condition they are sometimes used in lieu of asparagus; but they soon harden and become tough and evergreen. They reach a height of two, or two and a half feet, and are well furnished with the leaf-like cladodes, sharp-pointed and stiff. It will be noted that the very short stalk of the cladodes is twisted in order to bring those organs in the same plane as the stem. The small greenish-white flowers are produced from the centre of the cladode, and consist of a six-parted perianth—there being no distinction between petals and sepals. Respecting these flowers there is some slight misunderstanding on what are

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perhaps minor points, but Science requires that even minor points should be properly understood. The anther-bearing (male) flowers are borne by a different plant from the pistil-bearing (female) flowers, or on a separate stem from the same rootstock. They are said to be solitary and persistent. The female flower may be persistent, but the males are not, neither are the latter solitary. Two male buds are produced in the little pouch of the cladode, and one appears, discharges its pollen, drops off and is succeeded by the other. The female flower is succeeded by a bright red berry, about one-third of an inch in diameter. The flowering period lasts from early in February until well on in April. There is a form with larger, lance-shaped cladodes, and flowers in racemes, sometimes seen in plantations; it is a Portuguese species, *R. racemosus.*

Colt's-foot (*Tussilago farfara*).

The Colt's-foot has seen better days, so far as human popularity is concerned. Time was when it had a wonderful reputation as a curer of coughs and healer of chest complaints. Its scientific name is based upon this reputation, for *Tussis*, a cough, is the Latin root from which *Tussilago* is derived. It is still used in a small way for such complaints, and we believe its leaves are an ingredient in the patent cigars sold for the cure of asthma and other bronchial affections. That by the way. Our concern just now is with the flower as such. It is one of those precocious flowers that hasten to break forth before the green leaves are ready. It is taken for granted that, early as the Colt's-foot blossoms, it does not do so until winter has gone, and that we may then look with confidence for milder weather. As a rule this is so, but occasionally either Colt's-foot or the Clerk of the Weather makes a mistake. The flower-head is a composite, and, not unlike a daisy that by some means has been changed to a bright yellow. Each one

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Coltsfoot.
Tussilago farfara.
— Compositæ. —
$^2/_1$ *nat. size.*

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Daffodil. Lent Lily.
Narcissus pseudo-narcissus.
— AMARYLLIDEÆ. —
$^{2}/_{3}$ *nat. size.*

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is borne singly on a tall scape, that is covered with long woolly scales. Ofttimes a number of these scapes come up together, and so full is the clayey earth of its thick rootstock and its burrowing offshoots, that the surface is thickly covered with the yellow flowers, which form a very grateful sight at that early date. The flower passes, the scape lengthens and supports a hoary head of soft *pappus*, or down, to which the fruits are attached, and of which the goldfinch makes free use as a soft bed for her new nest. Next come the cobwebby leaves, of a broad heart-shape, the edges angled and toothed, and the undersides white with cottony down. These leaves all spring direct from the rootstock. The flowers may be looked for any time after a cessation of frost, but usually appear some time in March. There is no other British species, though Don professed years ago to have discovered the Alpine Colt's-foot (*T. alpina*) on the high mountains of Clova ; but, like other of Don's records, this has never been substantiated.

Daffodil (*Narcissus pseudo-narcissus*).

The Daffodil as a wild plant in England is extremely local, but where it occurs it is in great profusion. In Scotland and Ireland it may also be found, but not truly wild ; it is only naturalized. With the Snowdrop and Snowflakes already described (page 1), it completes the representation in this country of the elsewhere important Order Amaryllideæ. All the plants of the Order are characterized by having the rootstock in the form of a bulb, the somewhat flattened flower-scape free from leaves (naked), though the flowers are first enveloped in a dry skin-like spathe, or bract. The flower consists of a perianth of six-coloured floral leaves, without distinction between sepals and petals, and fixed above (superior to) the ovary.

The few linear leaves of the Daffodil spring directly from the

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rootstock ; they are nearly flat, and of that glaucous, blue-green hue that we have noticed in the Snowdrop. They greatly enlarge after flowering. Only one flower appears on the scape, of which the perianth segments are clear pale yellow, but from the centre is produced a long tubular crown of a golden hue, with an uneven toothed margin. Within this tube are the six stamens, and the long style with its three-lobed stigma.

There are several well-defined departures from the typical form that may be found in certain localities ; but though these have received varietal names, they are believed not to have originated in this country, but to have been introduced on account of their variation. One of these (var. *lobularis*) has both perianth and crown of the same full golden yellow, and the crown distinctly divided into six lobes. Then there is the more robust var. *major*, in which, as the name suggests, the flowers are much larger, the perianth segments broader, and the flower of one uniform richer yellow. In South Cornwall, this large-flowered form is plentiful, and, apparently wild, growing on the slopes and summits of high hedges, and producing its flowers in February. *N. pseudo-narcissus* flowers ordinarily in March and April. The name of the genus is a mythological one applied by the Greeks to the *Narcissus poeticus*.

Yellow Rattle (*Rhinanthus crista-galli*).

Like Lousewort (page 29) and Eyebright (First Series, page 50), the Yellow Rattle is parasitical upon the roots of other plants, and is abundant in meadows and pastures. Its yellow flowers render it very conspicuous, and its identity is readily established by the light-green inflated calyx. The stem is square ; the leaves distant, opposite, stalkless, narrow, the edges deeply toothed. The calyx is a bladder with flattened sides, and a four-toothed mouth. The Corolla yellow, tubular, two lipped ; the

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Yellow Rattle.
Rhinanthus crista-galli.
— Scrophularineæ. —
$^2/_3$ *nat. size.*

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Butter-Bur.
Petasites vulgaris.
— Compositæ. —
Flowers $^{2}/_{3}$ *nat. size, leaf* $^{1}/_{12}$ *nat. size.*

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upper lip arched over, somewhat in the form of a knight's casque, with two blue lobes; the lower lip spread outward, with three lobes. Stamens four, concealed within the upper lip; anthers blue, hairy. There are two forms of flowers, as in the Eyebright: a larger on one plant, a smaller on another.

Note how well constructed this flower is for ensuring cross-fertilization. The lower lip serves as a convenient platform upon which a bee may alight. Pushing her head into the tube, it comes into contact with the stigma, for the style is curved forward to bring it in the way. The anthers are up above, under the roof, slightly attached to each other by the hairs; but the bee, anxious to get at the honey, pushes her tongue between the filaments, and the pressure there causes the anthers to spring apart and shake their pollen down on the bee's head, where it will be ready for fertilizing the next flower it visits. The flowers will be found from May to August.

The name is from the Greek *Rhin*, nose, and *anthos*, flower, in allusion to the upper lip which, when reversed, looks like a nose.

Butterbur (*Petasites vulgaris*).

Formerly included in the same genus with the Colt's-foot, but now separated from it, the Butterbur shows its affinity in the general character of its much larger leaves and its habit of flowering before foliation. In Butterbur the individual flesh-coloured flower-head is much smaller than that of Colt's-foot, and there are male heads and female heads; though the male heads contain a few female flowers, and the female heads a few males. The two forms of flowers are produced by separate plants. The male floret is bell-shaped, the mouth cut into five lobes; the female is a long slender tube with an obliquely-cut mouth and a protruding pistil. All the flower-heads are gathered into a large dense panicle, contained in two very large bracts.

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After the flowers come the leaves, which are, roughly speaking, kidney-shaped with irregular teeth. This is the leaf dear to children, who, finding it in damp meadows and on green roadside wastes, appropriate it for sunshades and sun-bonnets, for it often attains a diameter of three feet. Like those of the Colt's-foot, it is white underneath, and cobwebby both above and below in its young state, but the upper surface afterwards becomes clean. As befits so umbrella-like a leaf, it has a long thick handle in the shape of a leaf-stalk. It flowers from March to May, and is a boon to bee-keepers, for its numerous flowers are rich in honey. It is said that the bee-farmers in Sweden plant it near their hives on this account.

The name is derived from a Greek word signifying an umbrella or head-covering, suggested by the use to which children put it, as indicated above. This is the only British species; but *P. fragrans* (Winter Heliotrope), a Continental species, is naturalized locally in the South of England. It is abundant in South Cornwall and along the Thames about Kew and Richmond. It flowers from December to February.

Three-Fingered Saxifrage (*Saxifraga tridactylites*).

An interesting treatise might be written on the Flora of a Wall-top; in such a work the Three-fingered or Rue-leaved Saxifrage would receive prominent notice, for it is one of the prettiest of mural plants. It is not more than three or four inches high, with an erect stem covered with sticky hairs. The leaves are chiefly from the root, forming a little rosette; their general outline is wedge-shaped, but they are cut up into three (sometimes four or five) finger-like lobes, except those on the upper part of the stem, which are undivided. The flowers are only about one-eighth of an inch in diameter, the five petals little longer than the five lobes of the calyx-tube; but from the purity of their whiteness, and their erect bearing, they are

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Three-fingered Saxifrage.
Saxifraga tridactylites.
— SAXIFRAGEÆ. —
Nat. size.

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Bog-bean. Buck-bean.
Menyanthes trifoliata.
— GENTIANE.E. —
$^2/_3$ *nat. size.*

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fairly conspicuous. Stamens ten; styles two. Flowers April to June. Annual.

There are no less than twelve British species of *Saxifraga*, but few of these are liable to be mistaken for *tridactylites*. The nearest approaching it are :—

I. Alpine Brook Saxifrage (*S. rivularis*). A perennial, which starts with an upright stem, but this soon begins to trail, and roots as it goes. Its tufted stems are but slightly hairy, the kidney-shaped smooth leaves divided into fine lobes. Flowers white, two or three only, July and August. Moist Alpine rocks in Scotland, only at an altitude of from 3000 to 3600 feet. Rare.

II. Meadow Saxifrage (*S. granulata*). Perennial. Stem hairy and sticky, producing little brown bulbils, the size of a pea, at its base. Leaves smooth, kidney-shaped, cut into lobes; mostly radical. Flowers, 1 inch across, white, more or less drooping. Growing in patches, sandy fields and hedgebanks. Flowers April and May. Rare in Ireland.

III. Drooping Bulbous Saxifrage (*S. cernua*). A rare Alpine plant confined to Ben Lawers at an altitude of 4000 feet. Produces scaly buds at upper part of rootstock, and in the axils of the upper leaves. The drooping flowers are due in July, but these are rarely seen in Scotland.

Name, Latin, *Saxifragus*, breaking stones, from the rock-loving habit of certain species.

Buckbean (*Menyanthes trifoliata*).

It is well worth while for the flower-lover to go properly equipped to some boggy valley with well-greased boots that will enable him to walk on the oozy ground without fear of wet feet. There he will find a host of singular and beautiful plants that, according to ordinary notions, would seem to be out of place in unpleasant spots. The Buckbean, Bogbean, or Marsh Trefoil, is one of these bog plants, and there are few more beautiful ones in the whole of our native flora. It has a thick creeping rootstock, from which the leaves are given off alternately, the broad bases of their stalks clasping the rootstock. Each leaf is broken up into three smooth, oval leaflets. The flower-spike bears a number (three to twelve) of beautiful blossoms, with five-parted calyx, and a funnel-shaped corolla with five lobes which are curved outwardly. Externally the corolla is pinkish, but within it is pure white, covered with white fleshy

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filaments. The five stamens are attached to the corolla-tube, and are very distinct on account of their reddish colour. The plant is very easily cultivated; but is best appreciated when one alights upon a lonesome bog-fringed tarn in a wooded valley during its flowering time—May to July. There one may find the Buckbean rootstocks forming a matted raft stretching half across the tarn, their smooth trefoils shining, and setting off the pure whiteness of hundreds of flower-spikes. Such a sight will not readily be forgotten by the flower-lover.

Like all the members of the Gentian family, *Menyanthes* possesses bitter tonic properties, which caused the plant to be formerly used in medicine, in brewing, etc.

Furze (*Ulex europæus*).

Furze, Whin, or Gorse, is so widely distributed and so well-known in this country, that a description may be considered superfluous. There are none of our native shrubs that produce so fine a display as the Furze in its proper blooming time. We say "proper" blooming time, because there is truth in the old saw, "When the furze is out of bloom kissing's out of favour," which implies that the plant is always in flower. You can scarcely find a day in the year when a walk through a furze-brake would not be rewarded by the sight of a few of its golden flowers. But it is about April that its full glory is upon the Furze. Then it puts more heart into its blooming, and you may gather enormous trusses of deliciously fragrant flowers. When the Furze is but a seedling it has soft hairy leaves that are trefoils; but as the plant grows older the new leaf-material is produced in the form of spines, with sometimes minute leaflets at their base to show their nature. The larger spines are really branches, as will be seen when the flowers spring from them. Note that in this genus the calyx, which is divided into two parts only, is large and thin, minutely toothed, and

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Furze. Gorse.
Ulex europæus.
— Leguminosæ. —
$^1/_2$ *nat. size.*

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Grape Hyacinth.
Muscari racemosum.
— Liliaceæ. —
1/4 nat. size.

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coloured yellow, though this colouring is subdued by the spreading black hairs that cover it. There are large bracts below the flowers. The black, hairy pod is but slightly longer than the calyx, the valves elastic, which causes them when ripe to curl up with a crackling noise, and scatter the polished olive seeds to some distance.

There is a smaller species, the Dwarf Furze (*U. nanus*), about half the size of the above, with minute bracts, and the calyx merely covered with fine, close-pressed down, instead of the hairs of *europœus*, but the calyx-teeth more distinct. The pods, too, do not fly open, but persist on the bush until the season following their formation. Flowers July to November.

The name is said to be derived from the Gaelic, *uile*, all, and *ec*, a sharp point.

Grape Hyacinth (*Muscari racemosum*).

The Grape Hyacinth differs from the Squills (*Scilla*) in having the flower of a globular form, the perianth being merely cut into six lobes at the narrow mouth, whilst in *Scilla* (*see* First Series, page 14) the six segments are only connected near the base of the much more tubular flower. The stamens are attached to the walls of the flowers, and are very short; the ovary is egg-shaped, three lobed, with a short style and simple stigma. The seed capsule is very similar to that of *Scilla*. The flowers are dark-blue, very small (about one-sixth of an inch in diameter), but there are many of them, and these are gathered into a short raceme, with minute bracts and a short stalk. The upper flowers in the raceme are usually imperfect. The flowers give out an odour suggestive of plums, and eventually they turn to a reddish purple tint.

We have departed from our usual course in beginning our description from the top of the plant instead of the bottom, but must not forget the foundations. The bulb is small, with a fringe

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of much smaller bulbils growing from its base. The narrow leaves proceed directly from the bulb, and are half-round in section, grooved on the upper side, so long in proportion to their width that they lie prostrate. This is the only native species, and it is narrowly restricted to its British range, being found only in sandy pastures in the counties of Norfolk, Suffolk, and Cambs. A number of species occur in the South of Europe, and several of these are grown in our gardens. *M. racemosum* flowers in May.

The name of the genus is derived from the Latin *moschus*, musk, in allusion to the prevailing odour of the genus.

Moschatel (*Adoxa moschatellina*).

The Moschatel is a somewhat local plant, but very abundant wherever it occurs; and it is widely distributed over the country. But it is by no means a well-known plant, even where it is most plentiful. The truth is, it gets passed over among chickweed and other low, succulent weeds of the hedge-bottom and the damp copse-side. It is but four or five inches in height, and its yellow-green flowers do not make up in prominence for its low stature, in spite of their musky odour, to which its popular and specific names are due.

The Moschatel has a tuberous root, from which run half-buried creeping rootstocks with erect square stems, each bearing a pair of leaves. Each steam-leaf is cut into three leaflets; but there are also leaves that spring direct from the rootstock, and these may be cut into either one or two sets of three leaflets. The leaflets themselves are usually three-lobed. At the summit of the stem there is a flower of which the parts are in fours, whilst immediately below it are four others of which the parts are in fives. The calyx forms a broad open cup with rounded bottom, the free margin with two or three lobes. The corolla is of the order called *rotate* (of which a familiar instance

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Moschatel.
Adoxa moschatellina.
— Caprifoliaceæ. —
Nat. size.

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A. — **Tormentil.**
Potentilla tormentilla.

B. — **Barren Strawberry.**
Potentilla fragariastrum.

— ROSACEÆ. —

$^1/_2$ *nat. size.* $^2/_3$ *nat. size.*

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has already been given—the Periwinkle—in First Series) in which the lobes are not symmetrical, but appear to be rotating one after the other. The stamens are in pairs, each pair placed between the lobes of the corolla ; and the attachment of the anthers to the corolla tube is what is known as *peltate*—that is, from the back like a button is attached. The short style separates into three or five stigmas, and the ovary develops into a succulent green berry. This is the only species in the genus. Flowers from March to May. The name is from two Greek words, *a* and *doxa*, and signifies that the plant is of no account.

Tormentil (*Potentilla tormentilla*), and **Barren Strawberry** (*Potentilla fragariastrum*).

In describing the Silverweed (*Potentilla anserina*) in our First Series (pages 62, 63) we briefly alluded to the two species here figured. Both are very common plants, every dry heath and pasture producing the Tormentil, and most hedgebanks supporting the Barren Strawberry.

The ordinary form of the Tormentil is partly or wholly erect, the stalkless leaves of the flowering stem divided into three leaflets, and the flowers arranged in a cyme. The figure to the left of Plate 14 represents the sub-species *P. procumbens*, which is procumbent, the stem leaves divided into three or five leaflets, and sometimes stalked ; the flowers few together or solitary. In the figure the radical leaves have been cut away to exhibit the thick rootstock. The plant flowers throughout the summer.

The Barren Strawberry (*P. fragariastrum*) has a branching rootstock, with a tuft of silky radical leaves and hairy stalks. The important difference between this leaf and that of the Wild Strawberry has already been dwelt on, but it may be convenient again to mention it in conjunction with the figure. Those of the Wild Strawberry have sunken nerve-lines, whilst

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those of *Potentilla* have the upper surface free from such grooving. The runners, too, of the Strawberry, with the young plants attached, is another sufficient distinction. Flowers spring. Other species of this genus are :—

I. Spring Cinquefoil (*P. verna*). A somewhat hairy, local plant, with prostrate stem, the leaves with five to seven oval leaflets, with rounded teeth towards the tips, and arranged finger fashion (*digitate*); flowers few, yellow, ½ inch in diameter, April to June.

II. White-leaved Cinquefoil (*P. argentea*). Rootstock short, woody; leaves stalked, digitate with five narrow wedge-shaped leaflets, white and woolly beneath, and margins curled back; stems branched, leafy, 6 to 18 inches, half erect or recumbent. Flowers, ½ inch or less across, yellow, June and July. Dry pastures and roadsides, local.

III. Marsh Cinquefoil (*P. comarum*). Rootstock long, woody; stems 6 to 18 inches, purple; leaves pinnate, with five or seven narrow, coarsely toothed leaflets; flowers few, petals five, small, dark purple. Fruit like a strawberry, many achenes supported on a large, spongy, crimson receptacle, dry and persistent; ornamental. Flowers June and July, in bogs and marshes.

Jack-by-the-Hedge (*Sisymbrium alliaria*).

Jack-by-the-Hedge rejoices in the *aliases* of Garlic-mustard and Sauce-alone. It cannot be called a particularly interesting plant, but we have specially included it here because it is one of those plentiful hedgerow weeds that people are constantly meeting, and as regularly ignoring, its lack of beauty or showiness making it not worth "working out." It is an erect-growing, fresh-looking plant, though at first its stems had an inclination to grovel, instead of rising. The leaves are more or less heart-shaped, with rounded teeth at the edges, on long stalks of soft texture, and hairy beneath. It has a strong smell, suggestive of garlic. The flowers are small, white, the four petals arranged cross-wise. The pods are about 2½ inches long, slightly curved, the valves being keeled, which gives a four-angled appearance to the pod. It flowers in May and June. Other native members of the genus are :—

I. Thale Cress (*S. thaliana*). Another common hedgerow and wall-top weed, with few leaves and inconspicuous white flowers. Radical leaves, oblong, toothed, stalked,

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Jack-by-the-Hedge. Sauce Alone.
Sisymbrium alliaria.
— Cruciferæ. —
Nat. size.

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Sheep's Fescue-Grass.
Festuca ovina.
— Gramineæ. —
Nat. size.

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forming rosette. Stem leaves stalkless, narrow, all downy. Flowers ¼th inch diameter; May to September. Pods ½ to ¾ inch, curved.

II. Hedge-Mustard (*S. officinale*). Leaves deeply cut or lobed, toothed, hairy. Stem round, erect, with horizontal branches. Flowers very small (one-tenth of an inch), pale yellow. Pods, ½ inch, round, awl-shaped close to stem. Flowers June and July.

III. Flixweed, or Fine-leaved Hedge-mustard (*S. sophia*). A tall plant growing among rubbish shot on waste places, as much as 3 feet high, with leafy branches and much divided leaves, the segments very fine. Flowers small (⅛th inch), yellow, succeeded by slender, rounded pods (1 inch), with three ribs on each valve. Flowers June to August.

IV. London Rocket (*S. irio*), so-called because it sprang up abundantly in the Metropolis immediately after the Great Fire of London (1666). Approaching *S. officinale* in habit and character of leaves. Flowers yellow. Pods slender, smooth, round, 2 inches long; valves as in *S. sophia*. May to September.

Name, Greek, believed to have been applied to a species of cress.

Sheep's Fescue Grass (*Festuca ovina*).

The Fescue Grasses form an important and extensive genus of the Gramineæ, of which we have nine native species, comprising some of our most highly valued meadow and pasture grasses. The species we have selected for illustration (*Festuca ovina*) is most valuable for hilly pastures, where it flourishes and forms a very attractive food for sheep. This is said to be due to the large quantity of saccharine matter contained in the stems and leaves, not only of this species, but of the whole genus. Its neatness and dwarf habit also make it a desirable constituent of lawns. It is a perennial, very variable, glaucous grass, with rounded, bristle-like leaves (the upper ones sometimes flat), with a two-lobed ligule. The flowers are in panicles which have an inclination to be one-sided. The spikelets consist of as few as three or as many as twelve purplish flowers, whose structural formula is: Empty glumes 2, rarely 1, shorter than the lowest flowering glume, unequal, membranous, sharp pointed; flowering glumes convex, 3 to 5 nerved, with a short awn, upper ones sometimes empty, pales cleft, hairy-nerved; scales 2, notched; stamens 3, styles short, stigmas feathery. The plant varies in height from three inches to two feet. It

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flowers in June or July. Of the species most nearly approaching it we may mention the following :—

I. Barren Fescue-grass (*F. myuros*). Stems 6 to 18 inches, very slender, leafy. Panicle very narrow, branched at the base only. Lower empty glume small; flowering glumes 5 to 8, with slender awns as long as the glumes; stamens 1 to 3. Flowers June, on walls and sandy pastures. Annual.

II. Single-glumed Fescue-grass (*F. uniglumis*). Stems slender, 4 to 10 inches, smooth. Leaves short. Panicle short, spike-like, 2 inches or less, one-sided, pale green. Flowering glumes distant, narrow, strongly nerved, rough, rounded below, compressed above, 4 to 10 in number, with 2 or 3 stamens. June and July on sandy shores. Annual.

III. Rigid Fescue-grass (*F. rigida*). Stems 3 to 6 inches; leaves not brittle-like as I. and II., but with their edges rolled in to approach to that form. Branches of panicle arranged in two rows, the spikelets (3 to 5) often purple, all but stalkless; flowering glumes 7 to 10, rounded, smooth, with pointed tips, and faint nerves. June, on dry rocks and walls.

The name *festuca* is Latin, and signifies a wand or rod that was laid upon the head of a slave to mark his freedom; its application is obscure.

Cotton-grass (*Eriophorum polystachion*).

Frequently in crossing moors we shall come across bogs where the Cotton-grass is the most conspicuous feature, its ragged white banners all fluttering in the breeze, and, should our visit be paid in the evening, gleaming out in strong contrast with the dark-green vegetation around. It is well-named Cotton-grass, for its seeds are furnished with long streaming silky hairs, which are analogous to those of the Cotton-plant (*Gossypium*).

Eriophorum is not strictly a grass, but a sedge, yet for a popular name grass is near enough. The plant is a rush-like perennial herb, with a short rootstock from which the bluntly triangular stems arise to a height of a foot or more, each smooth, flat leaf enfolding the stem and the next younger leaf by its lower portion. From the centre of this leafy tube the flowering stem emerges with several dull greyish, scaly bodies at the top. These are the flower-clusters, or spikelets, and their arrangement is somewhat similar to the flowers of grasses. The overlapping

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Cotton Grass.
Eriophorum polystachion.
— Cyperaceæ. —
1/1 *nat. size.*

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Sanicle.
Sanicula europæa.
— UMBELLIFERÆ. —
Nat. size.

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scales are *glumes*, and all except the lowest two or three contain a flower, the anthers and stigmas protruding. Calyx and corolla are represented in these flowers by a number of fine bristles, which lengthen as the flower matures and become the long silky streamers of the fruit. There are three stamens, a one-celled ovary surmounted by a long style that branches at the top into three feathery stigmas. As the solitary germ in the ovary develops into the mature nut, the spike becomes transformed into a tuft of silken filaments an inch and a half or two inches in length. Flowers May and June.

There are, or were, three other British species :—

I. Slender Cotton-grass (*E. gracile*) similar to the type, but the stems longer and more slender, the leaves short, very narrow, sharply triangular and channelled. The glumes broad, blunt, brown, and ribbed. This is a very rare species, and has been recorded only from the bogs of Surrey, Hants, and Yorks; flowering in June and July.

II. Hare's-tail Cotton-grass (*E. vaginatum*). Stems many, round below, but passing into triangular above, smooth, with several leafless sheaths. Leaves thread-like, triangular, very short. Glumes olive, nearly transparent. Bristles very numerous. Flowering April and May.

III. Alpine Cotton-grass (*E. alpinum*). Rootstock creeping. Stems bluntly triangular, rough, very slender and stiff. Leaves bristle-like, short, rough, channelled and keeled. Spikes only ½ inch long, the glumes yellow-brown. Silky bristles crumpled, 4 to 6 only. Flowers in June. Formerly recorded only from a bog near Forfar, now drained, and from Durness in Sutherlandshire. Now believed to be extinct. Possibly one of our readers may rediscover it!

The name is from the Greek words *erion*, wool, and *phora*, bearing; suggested by the woolly heads.

Sanicle (*Sanicula europæa*).

Along the borders of woods, in old tree-shaded lanes, and in thickets we may commonly find patches of a glossy-leaved plant with little heads of minute white flowers. It is another of those plants which once had high reputation as healers, but which none but the botanist troubles about to-day. This was especially a plant "to make whole and sound all inward hurts and outward wounds," and so it was called the Sanicle, from the Latin, *sano*, to heal or cure.

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Most of the leaves spring direct from the stout creeping rootstock. They are cut into wedge-shaped fingers (*palmate*), the five lobes being each partially cloven into three, which have toothed edges. The smooth, unbranched stem is about a couple of feet in height, almost leafless. The umbels of flowers are so small, so irregular in form, that they do not look like umbelliferous flowers at first sight; yet they are not only umbellate, but compound umbels. The flowers are pinkish white, the outer row in a head bearing stamens only. The flattened oval fruits are densely clothed with prickles, which ensure the wide dissemination of the plant by clinging to the coats of the smaller animals. Flowers June and July.

This is the only British species.

Ramsons (*Allium ursinum*).

Ramsons is otherwise the Broad-leaved Garlic, a strong-smelling, pungent plant with a bulb like an Onion in the ground; it is, in fact, closely related to the Onion (*Allium cepa*), though that is not a native plant. The leaves, instead of being tubular as in the Onion, are spread out broadly oval, like those of the Lily of the Valley, for which indeed they are often mistaken before flowering; and they have leaf-stalks which sheath the base of the flower-stem. This flower-stem (*scape*) is three-sided, and supports an umbel of about twelve pure white starry blossoms, rich in honey, but giving forth the characteristic odour of garlic that is not pleasing to British nostrils. When the scape first emerges from amid the radical leaves the flower-buds are all wrapped up in a two-leaved envelope (*spathe*). When the flowers are open these leaves will be found immediately below the umbel. There is no distinction between calyx and corolla; the two combined are therefore termed the perianth, and this consists of six segments, which spread widely. Stamens six. Damp woods and shady hedgerows, from April to June.

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Ramsons. Broad-leaved Garlic.
Allium ursinum.
— Liliaceæ. —
1/2 nat. size.

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Thrift. Sea Pink.
Armeria vulgaris.
— PLUMBAGINEÆ. —
Nat. size.

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There are six other British species, but all are very rare with the exception of the Field Garlic (*A. oleraceum*), itself by no means common. It has half-round, narrow leaves, flattened towards the free end, ribbed. Flower stem round ; flowers olive, brown, or pink. Among the flowers are little bulbils. Flowering in July on the borders of fields.

Name, Latin, *Allium*, garlic.

Thrift, or Sea-pink (*Armeria vulgaris*).

In old-fashioned gardens the Thrift may frequently be seen forming a compact edging to beds and borders. Probably few of the people who thus grow it are aware that its natural habitat is on the rocks and cliffs of the seashore, or the rocky sides of high mountains. It is in such situations, even to the altitude of nearly four thousand feet, that the rambler will meet this charming flower. As we pen this description, the rocks right down to high-water mark, the cliffs above, and the stone-faced hedges of the fields still higher are brilliant with the long-stalked, pale-rosy heads of flowers rising from the bright green cushions of grass-like leaves.

The rootstock is long, thick, woody, and much branched. Every branch ends in a bundle of leaves that are truly linear, being about one-twentieth of an inch in breadth, and usually about four inches long. From the centre of this leaf-bundle rises the smooth, softly hairy flower stem, six to nine inches long, ending in the half-round bunch of flowers, with their involucre of thin, tough scales. The lowest of these scales are prolonged downwards to form a purplish sheath, half an inch long, round the stalk. The individual flowers may be separated easily from the cluster, and will be found to consist of a fine-lobed, funnel-shaped calyx, of similar character (*scarious*) to the involucre, and a corolla of five clawed petals. There are five yellow anthers, and the ovary bears five long, thread-like stigmas.

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The flowers in one head do not all open at the same time, and the heads are sent up in succession from April to October.

There is one other British species :—

Plaintain-leaved Sea-pink (*A. plantaginea*), but it is found only in Jersey. It has much broader leaves, and is generally a stiffer, stouter plant, with darker flowers. June to August.

Winter Cress (*Barbarea vulgaris*).

Under the name of Land Cress, to distinguish it from *Nasturtium officinale*, the Water Cress, *Barbarea vulgaris*, had once a fair reputation as a salad herb ; but the cultivation of crisp and tender ingredients of the salad-bowl in our kitchen gardens has all but effaced our knowledge of the tougher, somewhat stringy, wild salads with which our forefathers had to be content. In general appearance, at a short distance, it is not very unlike Water Cress, showing a tuft of glossy, pinnate, dark-green leaves throughout the winter months, and from its heart sending up an erect, angular, leafy stem in spring, which bears dense racemes of small yellow flowers in May, on axillary branches. The portion of the plant represented in our plate only shows the stem-leaves and flowers. These leaves, it will be seen, are very variable ; some have merely a wavy margin, a couple of lateral lobes and ears (*auricles*) at the base ; the larger ones have a big terminal lobe, and the lower portion is deeply cut in a pinnate manner. The lower leaves are truly pinnate, with a larger terminal leaflet. The plant is common on damp waste places.

The flower consists of four equal sepals, which are almost erect when the flower is open, not spreading widely. The four petals have the lower portion reduced to what is called a "claw," a bit of floral economy, of which we shall meet frequent examples where the sepals are erect or joined into a tube—notably in the Pink tribe. A glance at the arrangement of these sepals and petals is sufficient to show us we are dealing

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Winter Cress.
Barbarea vulgaris.
— CRUCIFERÆ. —
Nat. size.

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Horseshoe Vetch.
Hippocrepis comosa.
— LEGUMINOSÆ. —
¾ *nat. size.*

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with a plant of the Cruciferæ. They are succeeded by long slender pods, compressed, and squarish in section, ending in a more slender point, the remains of the style.

There are several natural varieties, sufficiently marked to have been regarded as distinct species by some authorities, but which Hooker treats as sub-species ; they are—

Sub-sp. *B. stricta*, with upper leaves entire, and the lower with oblong terminal lobe ; flowers smaller ; pods in a dense narrow raceme on erect footstalks.

Sub-sp. *B. intermedia*, with many leaf-segments, pods in dense raceme, four to six times as long as their footstalks.

American Cress (*B. præcox*) is a garden escape found by roadsides ; probably a cultivated form of *vulgaris*. Leaves pinnatifid, segments narrow ; petals three times as long as sepals ; pods long and distant, scarcely thicker than their footstalks.

The genus is named after St. Barbara.

Horseshoe Vetch (*Hippocrepis comosa*).

The flowers of the Horseshoe Vetch are probably often passed over as belonging to the Common Bird's-foot Trefoil (see First Series, page 43), but the plant as a whole, or its leaves or pods, could not be so mis-identified. This is a perennial plant with a woody rootstock, from which spring many branching stems. The leaves are pinnate, like those of Sainfoin (First Series, page 49), though the leaflets are not so numerous. In *Hippocrepis* they vary from four to eight pairs, with an odd one at the tip. The flowers as mentioned have a general resemblance to those of *Lotus*, and are from six to ten in each umbel. They are succeeded by pods that in no way resemble *Lotus*, being rough, serpentine in shape, as represented in our figure, and jointed. It flowers from May to August, and may be looked for on chalk hills and stony pastures, but only in England, and in Ayr and Kincardine. It appears not to occur in Ireland. This is the only British species.

The name is from two Greek words, *ippos*, a horse, and *krepis*, shoe, in allusion to the form of the pods. If broken at the joints each portion containing one seed bears some resemblance to a horseshoe.

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Water Violet (*Hottonia palustris*).

The Water Violet is not so near being a real Violet as a Primrose. When aquarium-keeping was a fashionable rage, *Hottonia* had a fair chance of extirpation; but probably the botanist is the only one who wants the entire plant now, though every person that sees the beautiful pyramid of flowers desires to gather it. It has long, silvery-looking roots, sometimes imbedded in the mud at the bottom of ponds and ditches, sometimes suspended half-way in the water. The branches bear dense tufts of light feathery leaves, which are all submerged. The flower-stem is from one to two feet in length, standing well above the water, and bearing the flowers in whorls well apart. Each flower is on a big foot-stalk, which stands in the axil of a slender bract; and consists of a five-parted calyx, a white or pale-purple corolla of salver-shape, cut into five lobes, and with a yellow centre. The stamens and pistil are similar to those of the Primrose, and, like that plant, this bears flowers of two forms. Some of the buds are like certain ones in the Violet and Wood Sorrel, and never open (*cleistogamous*), though they produce fertile seeds. In *Primula* and *Lysimachia* the seed capsule opens at the top, in *Anagallis* splits around its circumference, but in *Hottonia* the same form of vessel splits into five segments, which are connected only at top and base. It flowers in May and June; and is not found north of Durham and Westmoreland, nor west of Somerset, nor south of Somerset and Kent.

The genus (of which this is the only British species) is named after a professor of botany at Leyden, Pierre Hotton, who died 1709.

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Water violet.
Hottonia palustris.
— PRIMULACEÆ. —
¾ nat. size.

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Water Fennel. Water Crowfoot.
Ranunculus trichophyllus.
— RANUNCULACEÆ. —
Nat. size.

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Water Crowfoot (*Ranunculus trichophyllus*).

What the Wild Roses and the Brambles are to the "splitter" and species-monger, so in a minor degree are the aquatic species of Ranunculus; they enable him to enjoy "delight of battle with his peers." Whether we accept the eight species of Hooker's "Student's Flora" or the much larger number of names that will be found in the works of various authors, or are content, on the other hand, to regard all as one species under the name of *Ranunculus aquatilis*, we shall find authorities to support our position. We should advise the beginner for his own peace of mind to commence by regarding the Water Crowfoots he meets in pond and stream as *aquatilis*, and by making a fairly extensive collection of examples from various localities, amass material upon which he may found his own conclusions as to the validity of existing segregations. After careful study and comparison of the specimens in a number of magnificent collections, Hooker writes: "Opinions vary as to whether the eight forms, or even segregates of them, should be ranked as one or more species, sub-species, or varieties. . . . Of the characters attributed to these and their subordinate forms by critical authors, I find some variable, others valueless, and still others deceptive."

The form we have figured is that which Hooker describes as *Ranunculus tricophyllus*. It is distinguished by having the floating leaves, when present, divided into three lobes or three leaflets; the submerged leaves finely divided into stiff, almost black segments, which do not collapse into a shapeless mass when taken from the water. These submerged leaves, though they appear to be little other than stalks, have scarcely any footstalk beyond what is hidden by the very large stipules. The petals are narrow and distant one from another, yellowish towards the base; stamens few. It occurs in still waters, and flowers in May and June.

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We have already dealt with the general characters of the genus Ranunculus (First Series, page 18), and described several of the terrestrial species.

Millet-grass (*Milium effusum*).

In the First Series of this work we gave a general outline of the structure of grasses; but as we shall have occasion to introduce several species in the present volume, it would perhaps be a convenience to our readers to repeat part of what we then wrote.

"The spikelets are borne in threes, side by side, but only the central one is perfect, the lateral ones being barren. Taking this central one from the others, we find two outer inflated scales (*glumes*) embracing two other scales, one of which, with the cleft tip and two keels on the back, is the *pale*; the other, ending in a long awn, is the flowering glume, within which is the ovary surmounted by its two feathery stigmas. From beneath the ovary spring the three stamens and two minute scales, called *lodicules*, which answer to the perianth in ordinary flowers." These remarks applied to the Wall Barley; slight modifications will fit it for Millet-grass.

Millet is a perennial woodland grass, delighting in the shade of trees, with long, thin, broad and flat leaves, rough on the upper surface, and pale green. The spikelets are small, and borne in a loose panicle, each containing one flower only. Some of these panicles are nearly a foot in length; that is, without reckoning the leafy stem. The spikelets are set on hair-like, spreading branches, and the general effect is light and graceful. Taking a spikelet to pieces, we find two empty three-nerved glumes. Within is the flowering glume, also three-nerved, not awned like the Wall Barley. There is a two-nerved pale, and the two minute scales, which are fleshy, and toothed on one side. Stamens, three; stigmas, two. When the large seed is

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Millet Grass.
Milium effusum.
— Gramine.e. —
1/4 nat. size.

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Hairy Rock Cress.
Arabis hirsuta.
— Cruciferæ. —
$^{2}/_{3}$ *nat. size.*

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ripe the flowering glume hardens round it, and becomes white and polished. Flowers May and June. The only British species.

The name is the Latin for Millet (*Panicum*), with which Millet-*grass* must not be confounded, in spite of the similar name.

Hairy Rock-cress (*Arabis hirsuta*).

The Rock Cresses, of which we have four native species, are lovers of dry rocky places, wall-tops, and the like. They are among the plants that ordinary flower-lovers neglect as "uninteresting," because generally inconspicuous. We have included several of such common plants in this work, with the distinct object of making them better known, feeling sure that it is not until we have learned a good deal about a plant that it becomes interesting. They are Cruciferous plants, like Jack-by-the-Hedge and Penny-cress.

The Hairy Rock-cress (*A. hirsuta*) is the most widely distributed species. It is a biennial or perennial plant, covered with short, coarse hairs, with many slender leafy stems from one foot to two feet in length. The radical leaves form a rosette, and are scarcely stalked; those on the stem are quite stalkless and partly clasping. The flowers are small; the sepals short, the petals white and spreading. They are succeeded by slender erect pods. Flowers June to August. The other species are—

I. Alpine Rock-cress (*A. petræa*), a rare perennial confined to the mountain districts, where it ascends over 4000 feet. Stem 3 to 6 inches, branched. The leaves are stalked, the radical ones deeply cut into opposite lobes, the terminal lobe larger than the others; the stem leaves with an almost entire margin. Flowers white or purplish; June to August.

II. Bristol Rock-cress (*A. stricta*), a very rare, hairy perennial confined to rocky places in Somerset and Gloucester. Radical leaves, shortly stalked, fringed with hairs, cut into wavy lobes that point upward. Stem 5 to 10 inches. Flowers large, cream-coloured, the petals wedge-shaped, narrow. March to May.

III. Tower Mustard (*A. perfoliata*). Nearly smooth; annual or biennial. Stem

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2 to 3 feet, completely clasped by the stem-leaves. General aspect of plant pyramidal, due to decrease in size of upper leaves. Flowers pale yellow; May to July. Dry rocky places, local.

Name said to be from Arabia, in allusion to their love of dry places.

Large White Helleborine (*Cephalanthera pallens*).

The White Helleborine must be described as rare, but not so rare that a flower-lover need despair of finding it, if his rambles take him through a wood on the slope of a chalk down in May or June. Such a place is in our mental vision now, a long-stretching chalk-flank, well covered with pine and beech, with the great golden St. John's Wort beneath them, and hundreds of big Roman snails in the evening. There, on the grassy banks, one can always find this beautiful orchid growing. It is not tuberous-rooted, but has a creeping rootstock, from which rises a tuft of leafy stems, as much as two feet in height. These leaves are long and broad, the lower ones sometimes as much as six inches in length; the upper ones becoming bracts, in whose axils the creamy white flowers are produced. [We will ask the reader to refer to page 74 of First Series for general structure of Orchidaceæ, to avoid vain and lengthy repetition.] All the petals and sepals have their margins curved inward, except the lip, which curves outward, and is continued backwards into a spur. This lip (*labellum*) is formed of a basal portion and a triangular flap, which closes the entrance to the flower at first, then folds back to form a platform in front of a triangular opening, afterwards rising up and closing the aperture again. These movements refer to the fertilization of the flower by insects. There is no rostellum in this genus, and the pollen-masses are situated just above the stigmatic surface, whence they are dislodged by a visiting bee and carried off to fertilize another flower.

There are two other British species :—

I. Narrow-leaved Helleborine (*C. ensifolia*). Leaves slender, longer than in *grandiflora;* upper bracts minute. Flowers whiter, narrower. Similar situations and seasons, but more local.

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White Helleborine.
Cephalanthera pallens.
— ORCHIDEÆ. —
Nat. size.

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Star of Bethlehem.
Ornithogalum umbellatum.
— Liliaceæ. —
Nat. size.

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II. Red Helleborine (*C. rubra*). Very rare. Confined to limestone woods in Somerset and Gloucester. June and July. Lip white, remainder of flower rose-purple.

Star of Bethlehem (*Ornithogalum umbellatum*).

We have but one species of *Ornithogalum* which botanists admit as truly British, and two others of European origin which have become naturalized in this country. Of these we have selected, not the true Britisher, because that is rare and local, but one of the naturalized forms that is more widely distributed. This is, therefore, distinguished as the *Common* Star of Bethlehem. These plants have nearly all the characters of the Squills (*see* First Series, page 14), but whereas these have usually blue or purple flowers, of which the perianth early falls off, the flowers of *Ornithogalum* are white and persistent. Otherwise there is the same kind of coated bulb, narrow leaves all radical, withered-looking bracts, perianth of six floral leaves, six stamens with flattened filaments, and a three-valved fruit.

I. *O. umbellatum* has from six to eight concave leaves, each with a white central stripe springing from a bulb that is about 1 inch in length, producing smaller bulbs all round. The flower stem is tall (8 to 10 inches), bearing from six to ten flowers in a corymb, the foot-stalks of the individual flowers almost erect. Blossoms from 1 to 1½ inch across, the floral-leaves narrow, with a green midrib on the back. Flowers May and June, in woods and meadows.

II. *O. pyrenaicum* (Spiked Star of B.) has a bulb 2 inches long, with concave, glaucous leaves, withering when the flowers have come. Flower-stem stout and as much as 2 feet in length, the flowers in a raceme, their footstalks spreading outwards, but becoming erect as the fruit develops. Flowers 1 inch across, greenish, with a white margin to the floral leaves on the inner side. Flowering June and July. This is the true native, and is found in woods and copses locally in the counties of Somerset, Wilts, Beds, Berks, and Sussex. Young shoots sometimes sold and eaten under the name of French Asparagus.

III. *O. nutans* (Drooping Star of B.). Much more local than the last, being confined to the districts between Yorkshire, Durham, and Hereford. It has a 2-inch bulb, leaves 1 to 2 feet, concave, glaucous, with a white stripe, a 2-foot flower-stem. Flowers few, white with green midrib, as much as 1 to 1½ inch across, in a raceme, their footstalks curving downwards, so that the flowers nod. April and May.

The name is the same as that used by the ancient Greeks for the plant, and it is derived from *ornithos*, a bird, and *gala*, milk, but its significance is not obvious.

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Lousewort (*Pedicularis sylvatica*).

Wherever we find Lousewort growing we may be sure that the pasturage is poor, and liable to bring the flocks into bad condition, making them fit subjects for the attacks of parasites. Our forefathers knew this, but they regarded an innocent plant as the cause, instead of its being a mere sign ; and so they called it Lousewort, just as to the Marsh Pennywort (*Hydrocotyle*) they gave the names of White Rot and Sheep Rot, under the mistaken notion that it was the presence of this plant alone that rendered marshy ground unfit for pasture land.

The Lousewort has a short perennial rootstock, from which proceed several branching stems, which trail along the ground and spread all round. The leaves are much divided and feathery. The flowers are in loose spikes with bracts. The calyx-tube is angular, and split at the front into five lobes, of which the upper one is as it should be, but the others appear to be ambitious to become leaves. The corolla forms a long tube ending in two rosy lips of which the lower is divided into three lobes, the upper two. This upper one is longer and compressed at the sides ; within it the four stamens are hidden, two on each side. The anthers open on the inner side to discharge their pollen, and they are arranged in two pairs in such a way that the inner faces are pressed together, and the ripe pollen thus prevented from falling. But in order to get at the honey, a bee has to press open the upper lip of the corolla, and in so doing separates the anthers and lets down a shower of pollen, some of which will be carried away, and then detached by the stigma of the next flower visited, for it stands out before the anthers. Flowers April to August.

There is another species, the Marsh Lousewort (*P. palustris*), an annual which grows erect to the height of 1 foot or more, in marshy places, branching above, but not from the base. The corolla is a duller crimson in colour, and the upper lip has *three* lobes as well as the lower. Flowers May to September. Both species are parasitical upon various roots.

The name is from the Latin, *pediculus*, a louse, reflecting the vulgar designation.

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Lousewort.
Pedicularis sylvatica.
— SCROPHULARINEÆ. —
$^2/_3$ *nat. size.*

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Birthwort.
Aristolochia clematitis.
— ARISTOLOCHIACEÆ. —
Nat. size.

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Birthwort (*Aristolochia clematitis*).

Birthwort is not a native plant, but it is admitted into the British flora because it has been for a great length of time established in the vicinity of ancient buildings and gardens. As its name indicates, it was formerly in great repute as a medicine to alleviate the pangs of parturition, and ensure safe delivery. It is to-day found chiefly near ruins southwards of Yorkshire. The genus to which it belongs is a very large one, and is chiefly composed of tropical climbing plants.

A. clematitis has a creeping woody rootstock, and many erect shrubby stems, furrowed and angled, but not branched. The leaves are heart-shaped, smooth, glaucous beneath, the lobes (*auricles*) at the broad end arching towards each other. The flowers are produced from the axils of the leaves in clusters of from four to eight; and the flower is the remarkable portion of the plant. There is no corolla, but the calyx is drawn out into a long tube with an oblique trumpet-mouth, and a globular base. Within there is a short and stout style with six lobes; and attached to it are six anthers, which do not ripen until the stigmas have been fertilized. Should you come across this plant do not lose the opportunity for making yourself acquainted with its fertilization process. The flowers that are more or less erect are newly open, whilst those that take a direction below the horizontal have been fertilized. From what we have stated as to the stigmas maturing before the anthers, it will be clear that self-fertilization is not probable, and that the pollen must be brought from an older flower. The carriers are small flies, to whom the unpleasant odour given off by the flower is attractive. They enter the broad mouth, pass easily along the narrowed portion of the tube, and range freely about the globular cavity, passing over the stigmas and brushing off the pollen they brought on back and legs. But they cannot yet get out again, for the narrow tube is clothed with long hairs that bend

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only in a downward direction, allowing free ingress, but effectually resisting exit, until the flower is fertilized and the anthers have discharged their pollen. With this the flies get dusted ; then the hairs shrivel up, and the flies depart to visit some younger flower and fertilize it. It flowers from June to September.

Sandwort Spurrey (*Spergularia rubra*).

The "Floras" give descriptions of several species of *Spergularia*, but these vary so and overlap in such a manner that we are inclined to agree with Hooker that his four species are merely sub-species of one. Although common and widely distributed in this country, Sandwort Spurrey is by no means a well-known plant ; yet it is exceedingly pretty and neat. Its various forms occur in gravelly soils, about salt marshes, and among seaside rocks. The specimen which sat for the following pen-portrait grew with its woody rootstock jammed in a crevice of the rocks, just above high-water mark, below our Cornish home. From the rootstock a great number of slender ruddy jointed stems start off, but remain almost prostrate. At the joints the leaves grow in little bunches, surrounded by semi-transparent bract-scales ; each leaf in a bunch being of different size from the others, almost cylindrical, thicker towards the free end, and bluntly pointed. The upper portions of the stems, also the sepals, are covered with short, glandular hairs. There are five sepals of a ruddy-green colour. The petals, too, are five, of a bright rosy tint, the under-surface paler. Stamens ten, the anthers bright yellow. Stigmas three. When the flower has faded its short stalk hangs down, but when the seeds are ripe the stalk again becomes erect. Flowers June to September. The name of the genus is derived from *Spergula* (see page 68).

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Sandwort Spurrey.
Spergularia rubra.
— CARYOPHYLLEÆ. —
Plant N. S.; flower $^2/_1$.

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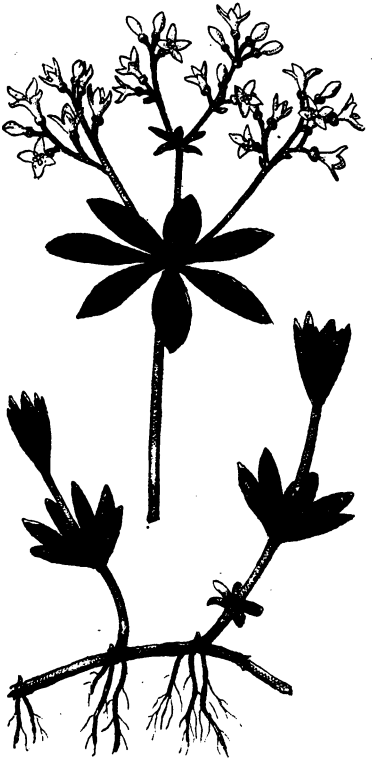

Woodruff.
Asperula odorata.
— RUBIACEÆ. —
$^2/_3$ *nat. size.*

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Woodruff (*Asperula odorata*).

A good old-fashioned favourite among wild-flowers, better known indeed to our foremothers than to the present generation, it having been in request for giving a pleasant country odour to the clean linen neatly folded and put away in the linen-press. The great virtue of Woodruff consists in its giving forth this sweet savour not in life, but in death. As it grows in close patches in the wood or copse, it is a pretty enough object in its series of bright, shiny ruffs one above another, and its head of minute ivory-white, funnel-shaped flowers surmounting all; but it is then only slightly odoriferous. It is when its juices are drying up, after the plant is gathered, that it yields the sweet odour of new-mown hay.

Woodruff has a thin rootstock that creeps underground among the light leaf-mould of its favourite habitat. Its slender stems are quite erect, and attain the height of a foot or a little more. The neat smooth leaves are borne in the regular whorls of seven, eight, or nine leaves that give the name wood*ruff* to it. The flowers, which appear in May and continue through June, are succeeded by tiny fruits that are covered with barbed bristles. The name of the genus is from the Latin *asper*, rough, in allusion to the hairiness of some species.

There is one other native species :—

The Squinancy-wort (*A. cynanchica*), a smaller plant, not odoriferous. It may be readily distinguished by the fact that there are but four leaves in each whorl or ruff, and of these two are smaller than the others. The leaves, too, are stiff and curled back, ending in a little point. The flowers are much smaller than *odorata*, and pinkish on the outside of the corolla. It occurs in drier situations, such as hedge-banks. June and July.

Herb Paris (*Paris quadrifolia*).

This, the only British representative of the genus, presents the anomaly of a liliaceous plant, with its parts usually in sets of four. There is a stout creeping rootstock, with a rounded

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stem about a foot in height, bearing a whorl of leaves and a solitary flower. The general outline of the leaves is oval, but pointed at each end; these are almost always four in number, arranged in two opposite pairs (*decussate*) on the same level. Rarely, there are only three, or as many as five or eight. From the centre of the leaves the flower-stalk rises, slightly curved. The flower is about an inch and a half across, consisting of four green lance-shaped sepals, and a like number of yellow petals, as long but only about one-fourth of the width. The eight (sometimes twelve) stamens are singular, in the fact that the tissue connecting the two cells of each anther is extended above the anther to a considerable length. The four-celled ovary develops into a black-hued berry, which splits irregularly to discharge its black seeds.

It is a local plant, but the flower-lover may hope to come across its striking form one day in May or June, when rambling through some moist, shady wood.

The name is said to be from the Latin, *par, paris*, equal, in allusion to the four-parted regularity of this species.

The Columbine (*Aquilegia vulgaris*).

It is a difficult thing to decide, when one has found the Columbine growing wild, whether it is not a garden escape that has increased and become naturalized. One should always be chary of assuming its true wildness, if it is found near an existing house or the site of a former dwelling. But that the Columbine is a true native of woods in England and Ireland there can be no doubt.

Columbine forms a rootstock from which the radical leaves grow in bundles, each leaf-stalk spreading out at its base into wings which enwrap the next newer leaf, and from the centre of the bundle rises the flowering stem. The long-stalked leaves are divided into two or three portions, each stalked and again

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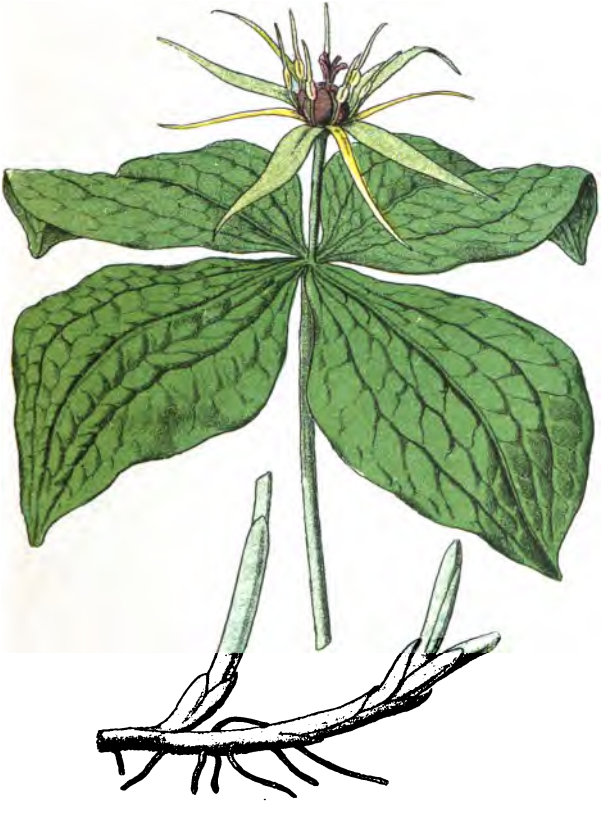

Herb Paris.
Paris quadrifolia.
— Liliaceæ. —
Nat. size.

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Columbine.
Aquilegia vulgaris.
— Ranunculaceæ. —
$^{2}/_{3}$ *nat. size.*

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cut into small leaflets which are lobed and toothed ; they are of a glaucous hue. The long flower-stalks are leafy, and bear many flowers in a panicle, all drooping. The flower parts are in fives. The sepals are thin and broad, coloured purplish blue like the petals. The concave petals terminate at the back in a curved hollow tube, with a hollow knob at the end in which honey is secreted. The ovary consists of five carpels, each with its own style and stigma. The stamens mature before the stigmas, so that cross-fertilization takes place. At first the stamens bend downwards, but successively rise up as they mature, and come in the way of insects seeking the honey, who will thus convey the pollen to a flower that opened earlier and now has its stigmas ripe. The carpels develop into dry leathery bags (*follicles*), which split along the upper edge and disclose a large number of very glossy, greenish-black seeds. Flowers May to July.

The name is derived from the Latin, *aquila*, an eagle, the petal and spur inverted being supposed to resemble the head, neck, and shoulders of that bird. Similarly, the popular name is derived from Latin, *columba*, a dove, whose likeness is seen in the same parts.

Fritillary, or Snake's-head (*Fritillaria meleagris*).

Another plant of the Liliaceous tribe, without distinction between petals and sepals. It is a plant of wet meadows and pastures, that must be described as rare, for its range is limited, though in some of the places where it is found it is fairly abundant. The bulb is small, composed of only two or three thick scales ; the leaves very narrow (not more than one-third of an inch), but six or eight inches in length. The flower-stem is from a foot to a foot and a half long, leafy, with a solitary flower, or occasionally two flowers. These flowers, appear in May, are much like a tulip in shape, but dr

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The six floral leaves are marked with a check pattern of pink and dark purple; there is a honey gland at the base of each. The unexpanded flower is supposed to resemble the head of a snake; hence one of the popular names. The six stamens have yellow anthers. There is a variety with white flowers.

This is the only species occurring in this country, and by some it is not considered to be really indigenous. Its range is from Norfolk and Stafford to Somerset and Hants. The name is from the Latin, *fritillus*, a dice-box, though the allusion is really to the chequered board upon which the dice were thrown.

Venus' Looking-glass (*Specularia hybrida*).

This singular name for a little-known plant is derived, some say, from the shape of the *limb* or flat portion of the corolla, which is supposed to resemble a mirror; others, however, aver that the name is due to the shining of said corolla in the corn-fields where it grows. It was formerly included in the genus *Campanula*, and even now it is only next door to the Bell-flowers. This is often called the Corn Bell-flower, but the flowers are too long and slender to be fitly called bells.

It is an annual plant, with small egg-shaped or spoon-shaped root-leaves on broad foot-stalks; those on the angled stems are stalkless, oblong, and waved. The flowers are produced in the axils of the leaves. The calyx-lobes are longer than the corolla. The corolla forms a slender tube, all the petals being united by their edges so far as they are included within the calyx, but the spread-out lobes are separated from each other by deep clefts. The inner face of the corolla is bright blue, the outside lilac or paler blue. In *Campanula* the ovary and the seed-capsule are short and broad; in *Specularia* these are very long and slender, triangular. This is the only British species.

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Fritillary. Snake's Head.
Fritillaria meleagris.
— Liliaceæ. —
Nat. size.

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Venus' Looking Glass.
Specularia hybrida.
— CAMPANULACEÆ. —
Nat. size.

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It flowers from June till September, in cornfields on dry or chalky soils, chiefly in the eastern and southern counties.

The name is from the Latin, *speculum*, a mirror.

White Beam (*Pyrus aria*).

In woods and copses in a chalky or limestone district the White Beam may be frequently seen, though it is a local tree, and one that does not obtrude itself much upon the attention. It is one of the Apple-genus, though it differs from the Apple and Pear in having its leaves deeply jagged at the edges, or sometimes lobed in pinnate fashion, white and woolly on the under surface. Its flowers are white, of similar form and structure to those of the Apple, in loose flat corymbs, which appear in May and June. The fruits are miniature globose Apples, about half an inch across, of a rich scarlet colour, which render the tree conspicuous in autumn by the contrast afforded by their glowing clusters and the constantly revealed snow-white undersides of the leaves. The pulp of these fruits is not very juicy, rather mealy and of acid flavour; it becomes sweeter when ripeness is passed, and the fruits are then in request by birds and such of the mammals as can come at them. They have been used to brew a kind of beer from them, and to distil a spirit from—as what has not! Several local names have been bestowed upon it, such as Red Chess-Apple, Sea Ouler, White Wild Pear, etc.

The tree does not exceed the height of about forty feet, so that its timber is small, but its hardness and close-grain makes it valuable for small manufactures where these qualities are valuable.

There are two well-marked varieties or sub-species of this small tree, of which the characters are as follows:—

I. *Pyrus latifolia:* leaves varying from ovate-oblong to almost round, more or less lobed, the lobes wedge-shaped, saw-toothed, and sharp-pointed; grey-cottony beneath.

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II. *P. scandica:* leaves less leathery, oblong, deeply lobed or pinnatifid, lobes oblong or rounded; smooth above, covered with loose, grey-cotton beneath. Arran.

The other species of this genus are described in succeeding pages, with the exception of *P. aucuparia*, for which see First Series, page 117.

Butterwort (*Pinguicula vulgaris*). Plate 38.

This is another of our beautiful bog-plants; and, like the Sundew, not interesting on account of its beauty only, but for its carnivorous propensities also. *Pinguicula* is among our insectivorous plants, a fact that was not suspected till a little more than twenty years ago. It is a perennial herb that has no stem, but consists of a rosette of thick greasy leaves with incurved edges. From the centre of this cluster there are sent up several leafless, purplish stalks, from four to six inches in height, each bearing a solitary violet flower on the recurved tip. The calyx is five lobed, the lobes unequal. The corolla is two-lipped, unequal, the upper lip having two lobes, the lower three; there is also a slender spur. Flowers from May to July, in boggy ground chiefly in the north, but found sparingly as far south as Hants and Devon. The other British species are:—

I. Pale Butterwort (*P. lusitanica*), found only in the bogs of South-west England, from Cornwall to Hants; West Scotland, and Ireland. A much smaller plant, with inconspicuous lilac corolla, the lips nearly equal, the spur short, broad, blunt. Leaves thin and small. Flowers June to October.

II. Alpine Butterwort (*P. alpina*). Intermediate for size between the foregoing, but scapes shorter. Leaves thick. Corolla white with yellow throat, and very short, conical, broader spur, curved upwards. Bogs of Skye, and Black Isle, Ross-shire. May and June.

In these plants the upper surface of the leaves is covered with glandular hairs, which secrete a very sticky fluid, giving rise to its popular and scientific names, *pinguis*, being Latin for greasy. Insects, seeds or pollen, becoming attached by this fluid, set up an irritation of the leaf, which folds over its lateral edges slowly and secures the exciting object. It then secretes an acid fluid which possesses the power of rapidly dissolving and digesting the offending substance, which appears to be absorbed by the glands that secreted the digestive fluid.

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White Beam.
Pyrus aria.
— Rosaceæ. —
Nat. size.

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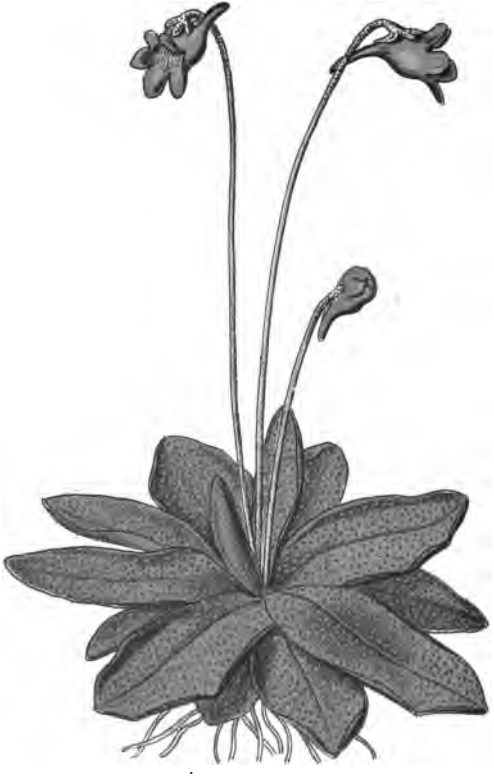

Butterwort.
Pinguicula vulgaris.
— LENTIBULARINE.E. —
$^2/_3$ *nat. size.*

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Field Penny Cress (*Thlaspi arvense*).

This is the Mithridate Mustard of old writers, by whom it was regarded as a valuable antidote to poisons. In many districts of England it is common in cornfields and on road-side wastes, but in the northern kingdom it is not nearly so plentiful. It is an annual plant, whose first leaves form a rosette upon the ground. Then up springs a slender, unbranched stem, bearing leaves whose general outline is that of an arrow-head, with waved teeth along the margins; above the leaves are many small white flowers, which are succeeded by much larger heart-shaped seed-vessels on long slender stalks which stand out from the stem almost horizontally. The flower parts are in fours, arranged crosswise. It flowers from May to July.

Now this description is very like one would have to write for a much more plentiful species, the Shepherd's Purse (*see* First Series, page 11), and therefore to prevent confusion we will try to tabulate those points in which they differ most—

	Penny Cress.	Shepherd's Purse.
Stem	Unbranched (*simple*).	Branched.
Flowers	¼ inch in diameter. Sepals *erect*.	⅛th inch in diameter. Sepals spreading outward.
Seed-pods	Spherical, much flattened, with *broad wing* all round. ½ to ¾ inch in diameter.	Heart-shaped, valves boat-shaped, *keeled*. ¼ to ⅓ inch in diameter.
Seeds	Five to eight in each cell.	Many in each cell.

If we soak a seed of each and skin it, we shall find a further and important difference. In that of Shepherd's Purse we shall find the embryo-root bent over on one of the future leaves; this would be described as "radicle incumbent." In

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the seed of Penny Cress we should see the root lying along the edges of *both* the seed-leaves (*cotyledons*), and should describe it technically as "radicle accumbent."

There are two other British species, both rare :—

I. Perfoliate Penny Cress (*T. perfoliatum*), occurs on limestone soils in East Gloucester. Its stem-leaves are heart-shaped, the root-leaves spoon-shaped. Pods small, *heart-shaped*, the upper part only winged. Flowers April and May.

II. Alpine Penny Cress (*T. alpestre*). Mountain pastures only, reaching an altitude of 2500 feet. Root-leaves oval, stalked. Stem-leaves arrow-head shaped. Pods *oval*, dented at top, valves winged above. Flowers June to August.

The generic name is Greek, from *thlaso*, flattened, in obvious reference to the pods.

Black Bryony (*Tamus communis*).

There is no connection between this plant and the White Bryony described on page 56; but they have this peculiarity, as well as a name in common—that each is the solitary British representative of an important Natural Order. *Tamus* alone in Europe sets forth the structure of the great Yam family, of such importance in the tropics. It has a large underground fleshy rootstock, black on the outside. Its long angular stem twines around the branches of bushes and ascends to a considerable height, its spirals coiled "against the sun," *i.e.* from right to left. The leaves are fine, large, heart-shaped, with entire edges and shiny surface, four inches long, on long stalks; green, but turning in early autumn to a fine bronze. The flowers of each sex are very small, and produced by different plants, which are therefore called *diœcious*. The males are in slender branched sprays from the axils of the leaves; the females are in shorter, curved sprays. The male flower consists of a six-parted perianth, with as many stamens attached; whilst the female flower contains a three-celled ovary with three styles, the stigmas lobed. The fruit is a soft, oblong berry, that becomes bright red when ripe. It flowers in May and June, and is common in hedge and copse, but must not be sought north of Cumberland.

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Penny Cress.
Thlaspi arvense.
— Cruciferæ. —
1/2 *nat. size.*

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Black Bryony.
Tamus communis.
— Dioscoreæ. —
$^{2}/_{3}$ *nat. size.*

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The roots are rich in an acrid juice, and were formerly cut in slices to serve as stimulating plasters. We believe they are still used to take away the discoloration from "black eyes" and other bruises. The etymology of the name is involved in obscurity, or at least the explanations given are by no means satisfactory.

Broom-rape (*Orobanche major*).

Like Yellow-Rattle, the Broom-rapes—of which there are six British species—are root-parasites, but they differ greatly in appearance from these others. The specific differences in the genus *Orobanche* are not very great, and the "splitter" has made a dozen species out of what others consider may be only two or three, varying according to the structure of the tribe of plants they prey upon. The Greater Broom-rape (*O. major*) has a stout fleshy stem about two feet in height. The whole plant is of a dingy purplish-brown and velvety. There is not a leaf upon it, though there are scales and bracts to represent leaves. The upper part of the stem becomes a spike of large flowers, of similar build to those of the Bartsia; that is, with a two-lipped corolla, the upper erect and two-lobed, the lower spreading and three-lobed, coloured with purple and yellow. There is a large bract under each flower, as long as the corolla, and the internal arrangements of stamens and pistil are of the same type as in the Scrophularineæ. The stigma is yellow. *O. major* is parasitic on the roots of the Furze and Broom, and flowers from June to August. It is the most widely distributed species. The other British species are:—

I. Tall Broom-rape (*O. elatior*). Parasitic on Great Knapweed (*Centaurea scabiosa*). Yellow. Bracts shorter than corolla, which is narrower, with lobes more toothed; otherwise similar to *O. major*.

II. Clove-scented *B.* (*O. caryophyllacea*). Parasitic on Bedstraws, Brambles, etc., in Kent. Reddish-brown, about 1 foot high. Stigma dark purple. June.

III. Red B. (*O. rubra*). Parasitic on Thyme, chiefly along west coast of Britain,

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and in Ireland. Red, less than 1 foot high. Corolla dull red, stigma pale red. June to August.

IV. Lesser B. (*O. minor*). Very variable; on Clovers, Ivy, etc. Stem slender, 2 feet, yellow-brown or purplish. Stigma purple. June to October.

V. Blue B. (*O. cærulea*). Stem slender, 1 foot, purple-blue. Stigma white. Corolla lobes pale blue with darker veins. June to October. Local.

The name is from two Greek words, *orobus*, a vetch, and *agcheo*, to strangle

Bugloss (*Anchusa arvensis*).

The Common Bugloss must not be confounded with the Viper's Bugloss (*Echium*, *see* First Series, page 26), owing to the similarity of the popular names; the plants will never be confounded when once seen, though they have certain characters in common, both plants belonging to the order Boragineæ. Bugloss is an exceedingly bristly—one might almost say prickly—annual, frequent about cultivated fields, upon a light soil. It grows to a height of little over a foot, the rough stems rising from a tap-root, from which also grow several stalked leaves, lance-shaped and thickly covered with sharp bristles, as, indeed, is the case with the whole of the plant with the exception of the corolla alone. The stem-leaves are stalkless (*sessile*), oblong, and narrow, and partially clasping the stem. The flowers are in cymes with leafy bracts, almost stalkless. The calyx is five-parted; the corolla tubular, *distinctly curved*, with five spreading lobes, a quarter of an inch in diameter, and of a bright blue colour. The mouth of the tube is closed by five convex, white, hairy scales, one at the base of each lobe. The five stamens are attached to the tube lower down. The four-celled ovary at the bottom of the tube develops into four nutlets. Flowers June and July.

There are two other species found in this country, but they are not natives—only long-established settlers. They are:—

I. Common Alkanet (*A. officinalis*), with softer bristles, and stout biennial root. Leaves narrow lance-shaped. Stem 1 to 2 feet. *Corolla tube straight.* Corolla deep purple, one-third of an inch across, with white scales. April to June. Rare.

II. Evergreen Alkanet (*A. sempervirens*). Perennial. With broad oval leaves.

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Broom Rape.
Orobanche major.
— OROBANCHEÆ. —
$^{2}/_{3}$ *nat. size.*

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Bugloss.
Anchusa arvensis.
— Boragineæ. —
$^2/_1$, *nat. size.*

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those of the stems with short stalks, those from the root with long stalks. Flowers on short footstalks, bright blue, two-thirds of an inch across, scales white, tube straight. May and June. Rare, but more widely distributed than *officinalis*.

Samphire (*Crithmum maritimum*).

Much nonsense has been written concerning the Samphire by so-called popular writers, who have probably never seen the growing plant. Taking their cue from Shakespeare's *King Lear*, in the well-known scene on the cliffs at Dover, where "halfway down hangs one that gathers samphire; dreadful trade!" they have described the plant as growing up the face of cliffs, and only accessible at great risks. The truth is, it grows more freely on the rocks at the cliffs' foot, except where it has been exterminated in such situations in order that it might be made into the well-known pickle.

The rambler who meets Samphire for the first time, unless it be in the flowering season, would probably regard it as having affinity rather with the Mistletoe than with the Wild Carrot and the Fool's Parsley. All its parts are thick and fleshy, and the leaves are so much dissected, that some little consideration is required before their true outline can be made out. The whole plant is exceedingly smooth and covered with that glaucous "bloom" that is common to many seaside plants. The perennial rootstock is wedged tightly in the crevices of the rocks, like those of the Sea Milkwort (page 83); and, like it, the plant may be found growing very close to high-water mark. The flowers are borne in fleshy compound umbels, but the whitish petals are minute and not nearly so striking as the yellow-green ovaries. These petals are broader than long, with a long point in the middle, turned over towards the stigmas, which form a thick, somewhat conical, disc. The most conspicuous feature of the mature plant is the contrast between the yellowness of its umbels and the bluish green of the leaves and stems.

This is the only British species of the genus, which is said to

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owe its name to *krithe*, the Greek for Barley, from a supposed resemblance between their seeds. The English name affords a good illustration of the way in which such names have probably been evolved from a sensible and descriptive term into one which has no meaning. Samphire was originally *Perce pierre*, or Rock-cress in French, and as "rock" and "Peter" are synonymous, it by-and-by became *Perce St. Pierre*, or St. Peter's-cress. Then the prefix was dropped, and by English pronunciation the name became changed into *San Pierre*, thus into *Sampier*, and finally Samphire. It flowers from June to September.

Bulrush (*Scirpus lacustris*).

We have already referred (First Series, page 51) to the general mistake that is made by the British public in calling the Great Reed Mace (*Typha latifolia*) by the name of Bulrush, and to the similar blunder made by King James' Bible-translators, who got into a complete muddle over it. The Hebrew words which they rendered "Bulrush" are two, *gome* and *agmon*, and modern Hebrew scholars declare these to be philologically identical, and to refer to the Paper-reed (*Cyperus papyrus*); but the translators variously rendered these words as "hook," "cauldron," "rush," and "bulrush." Our English name Bulrush is said to have been originally Poolrush, but by a process well known to philologists the *p* was turned into *b*, and as "boolrush" conveyed no meaning, the "ool" was changed into "ull" to identify it with the cow's mate; finally the second *l* was dropped as being redundant. And there we are; but there is no reason why we should continue the process, and shift the name altogether to a species in no way resembling it, and that is not even a rush.

The Bulrush is allied to the Cotton-grass and the Sedges. It is not usually a very leafy plant; in fact, its thick, spongy stems

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Samphire.
Crithmum maritimum.
— UMBELLIFERÆ. —
Nat. size.

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Bulrush.
Scirpus lacustris.
— Cyperaceæ. —
1/3 *nat. size.*

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are in most cases leafless. When the leaves occur they vary according to situation, whether the plant is growing in a pool or in a river; if in still water they are short and flat, with a keel; in flowing water they are much longer and strap-like. The stems are nearly an inch in diameter, and as much as eight feet in height, round, sheathed at the base. The flowers are in clustered cymes, with stout, straight branches, each bearing a cluster of two to six cylindrical spikelets of a red-brown colour. The glumes are arranged to overlap one another round a central stalk; they are two-lobed with a little awn, fringed with fine hairs, and, with the exception of the two lowest, which are empty, they each contain three stamens and an ovary, with a twice or thrice-cleft style. The perianth is represented by four or six bristles. July and August are the flowering months. There are thirteen other British species, but none calculated to be confused with the Bulrush.

The name *Scirpus* is Latin, and the same as that used by the ancient Romans for a Rush.

Water Plantain (*Alisma plantago*).

In spite of its name, in spite of its leaves, there is no relationship subsisting between *Alisma* and the true Plantains (*Plantago*). It is a fibrous-rooted perennial, with a short stem, swollen and fleshy at its base. The leaves are very large (8 or 9 inches long), supported on thick but soft stalks, two or three times the length of the leaf proper. These stalks are very broad at the base, concave, and overlap each other. The leaf-blade, with its five or seven parallel veins, bears a close superficial likeness to that of the Greater Plantain (*P. major*), though that of *Alisma* is much thinner and smoother. These leaves are more or less erect, and well-disposed for effect, so that the plant is worth growing for ornamental purposes. From the centre of the leaf-bases the flowering stem rises to a height

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of three or four feet. It is bluntly triangular, leafless; but about halfway up there is a whorl of narrow bracts, and from their axils flowering branches are given off. Each flower has a long, slender footstalk, and consists of three green sepals, three much larger pale rosy petals with yellow claws, six spreading stamens, and from twenty to thirty carpels. The bases of the stamens project, and on each side of them there is a honey-gland—twelve in all. The plant flowers from June to August, and may be found in ponds, ditches, and streams, plentifully in the south, rare in the north. The thick, fleshy base is rich in farinaceous matter, and when deprived of its natural acridity by drying, is available for food; the Kalmucks so use it. There is another British species:—

The Lesser Water Plantain (*A. ranunculoides*). Similar, but smaller. The leaves narrow, lance-shaped, three-nerved, about 3 inches long. Flowering stem about 1½ feet. Flowers pale purple, larger in proportion to plant than those of *A. plantago*. Bogs and ditches, May to September.

The name is said to be from a Celtic word, *alis*, water, in allusion to the habitat of these plants.

Red Bartsia (*Bartsia odontites*).

We have already called attention to several genera of the order Scrophularineæ, in which the species are parasitic upon the roots of other plants. These are Eyebright, Yellow Rattle, Lousewort, and to them must now be added Bartsia. All agree in their form of parasitism, and also in the fact that, despite their diversity of colour, they all turn black when the collector carefully dries and presses them for his herbarium. In general appearance Bartsia does not greatly differ from the Yellow Rattle, though, of course, it lacks the prominent bladders. Other points in which it differs are: this flower is not compressed like that, and the upper lip of Bartsia is arched over. The corolla is pink, or dull purple, and downy. The whole plant, in fact, is tinged with purple, and downy. Honey is secreted at the base of the corolla-tube. The anthers are hairy, and hang close together above the mouth of the tube; the filaments being so

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Water Plantain.

Alisma plantago.

— ALISMACEÆ. —

Flowers ½ nat. size, leaves ⅛ nat. size.

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Red Bartsia.

Bartsia odontites.

— SCROPHULARINEÆ. —

$^1/_2$ *nat. size.*

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bent as to allow room for the passage of a bee's proboscis in its search for honey. The anthers ripen before the stigma which afterwards comes into as prominent a position, and gets fertilized with pollen brought on the bee's back from an older flower. Flowers June to August, in fields and wastes. The other British species are :—

I. Yellow Bartsia (*B. viscosa*). Annual. Whole plant downy with viscid hairs, including yellow corolla. Lower lip of corolla large. Flowers June to October, meadows and pastures chiefly in extreme South of England and West of Ireland.

II. Alpine Bartsia (*B. alpina*). A rare perennial, found only in rocky alpine pastures in the north. Rootstock woody. Leaves somewhat leathery. Bracts purplish. Corolla dull purple. Flowers June to August.

The genus was named by Linnæus after his friend, John Bartsch, a Prussian botanist.

Vervain (*Verbena officinalis*).

In certain localities the wayfarer comes upon a rather inconspicuous plant that may track his path for a mile or more, and then for a score of miles he may not see a solitary example. The species we refer to is the bright-eyed little Vervain, a plant that has enjoyed a magnificent reputation as a herb "chock full" of medicinal and magical properties; but now apparently utterly neglected, save by the botanist, who is actuated by other reasons than the desire to be rid of calculi, to improve his eyesight, ward off the pestilence, or to secure good luck. He may be desirous of these things, but he does not expect them to follow on the plucking of a plant of Vervain, even when gathered with the proper incantations.

Verbena officinalis is the solitary representative in our flora of the important genus, and the more important Natural Order Verbenaceæ, which includes some 700 species, chiefly tropical. It is a perennial, with a woody rootstock, and four-angled stems from 1 to 2 feet in height, the upper part branched. The oblong leaves are cut either into a number of lobes arranged pinnately or into three larger lobes. They occur on the stems in

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pairs (opposite), or in threes. The flowers are associated together in terminal spikes, with bracts. The calyx is tubular, with five teeth, one often shorter than the others; the lilac corolla consists of a tubular portion and a spreading limb—what is known as salver-shaped. This spreading limb—the flat and most conspicuous portion of the corolla—is also five-cleft and unequally so to match the unequal calyx. Of the four stamens—mark how in all these matters the order resembles the Labiates—two are sometimes imperfect. The slender style ends in a couple of lobes, of which, however, only one is stigmatic. The flowers may be found from July to September.

The name Verbena was the classical Roman name for this plant especially, and also signified "altar-plants" in general.

Flowering Rush (*Butomus umbellatus*).

By ditches and the backwaters of rivers in June and July we may come upon a beautiful plant which, once seen, will never be forgotten. Its tall flower-stem, five or six feet in length, crowned with its spreading umbel of large rosy flowers, is a very striking object, and is certain to beget the desire of possession; though this is not always easy of accomplishment, for *Butomus* loves to grow at sufficient distance from firm land to make wading a necessity for its acquisition. The base of this noble plant is a stout creeping rootstock, from which all the leaves arise—there are none on the stem. These leaves are three or four feet long, of a slender three-sided form, of cellular structure, and sheathing one over the other at the base. The flowering-stem is round, and the umbel starts from an involucre of three thin papery bracts. The footstalks of these flowers are from two to four inches long, the flowers an inch across, made up of a six-leaved perianth, in two series of three, but all coloured and spreading. There are nine stamens, and six very prominent carpels with short styles; both carpels and anthers are coloured

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Vervain.
Verbena officinalis.
— VERBENACEÆ. —
Nat size.

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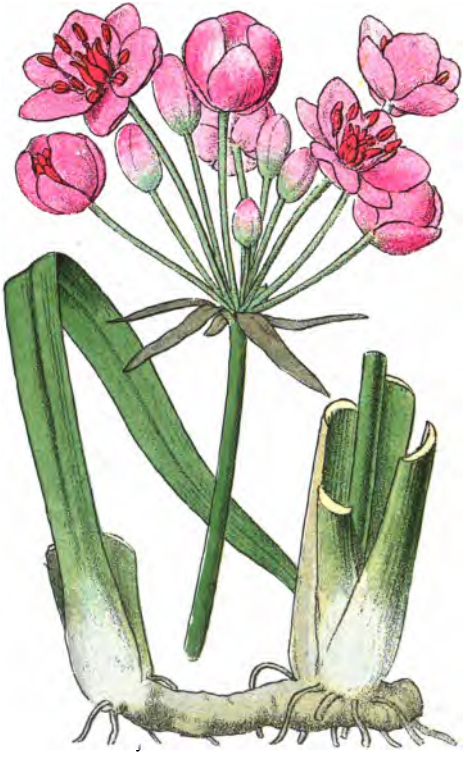

Flowering Rush.
Butomus umbellatus.
— Alismaceæ. —
$^3/_4$ *nat. size.*

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like the perianth. This is the only species of the genus, whose name is said to be derived from the Greek words *bous*, an ox, and *tomos*, cutting, from a notion that their leaves sometimes cut the oxen that water in the places where the Flowering Rush grows. Like the Water Plantain and the Arrowhead, it is included in the order Alismaceæ, and having said this it is unnecessary to add that the plant is a rush only by the courtesy of the unscientific public.

Spur Valerian (*Centranthus ruber*).

The noblest of our wall-plants. It is with regret we have to add that it is not truly wild in this country, but a visitor probably from Central Europe that has become naturalized on our old walls, and occasionally chalk-pits, like its companions the Wallflower and the Greater Snapdragon. Its popular name has, obviously, been suggested by the superficial resemblance of its crimson flower-heads to those of the Cat's Valerian, figured in the First Series of this work (page 104). But we trust our readers are not to be deceived by superficial likenesses; if so, let them glance at the leaves of each.

Spur Valerian has a woody perennial stem, from which many tough, smooth, round branches arise. The stalkless leaves are lance-shaped, thick of a grey-green hue, their broad bases sometimes with a few coarse teeth, but never cut up so as to have the smallest resemblance to those of *Valeriana*. The flower-head is bluntly conical, and the individual flowers are of very singular form. The calyx is a mere thickened margin to the ovary, but it unrolls and develops, after the fall of the corolla, into a feathery *pappus*. The corolla is very long ($\frac{1}{2}$ inch) and tubular, of the thickness of a stout pin, and ending in a hollow spur almost as long but more slender. Held up to the light, this spur will be seen to contain honey; but, of course, it is only long-tongued insects that are able to reach it. There are five

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lobes to the corolla, but one stands out strangely away from the others. The pistil, with its very slightly enlarged stigma, protrudes one-sixth of an inch beyond the corolla; and the solitary stamen, with its purplish anther, is almost as long. There is a faint sweet perfume from the flowers, and the root is also scented. The flowering time lasts from May to September. Sometimes the corolla is white.

The name of the genus is Greek, and derived from *kentron*, a spur or goad, and *anthos*, a flower.

Maiden Pink (*Dianthus deltoides*).

We have already made acquaintance with the great Pink order when we dealt with the Campion and Spurrey, but now we get to the typical genus of that order. All the species are characterized by their habit of growing in tufts, their narrow, grass-like leaves of firm texture, their tubular calyx, and general primness.

The Maiden Pink branches from its base, the branches slender and about a foot long. The leaves vary: on the upper part of the flowering shoots they are sharply pointed, lower down the points are blunted, and on the flowerless roots they are strap-shaped. They are also downy, almost rough, and are disposed in pairs, their bases joined. Flowers solitary, $\frac{3}{4}$ of an inch across. Calyx smooth, five-toothed, boldly ribbed, and with overlapping bracts below. The petals not touching, toothed at their edges; of a beautiful rosy colour, dotted with white. The flower is not odorous, but it secretes honey, and insects know it without the aid of scent. The honey is produced by a fleshy yellow gland at the bottom of the corolla-tube, so that only long-tongued insects like butterflies and moths can reach it. There are ten stamens and two long styles with curled stigmas; and the behaviour of these organs is worthy of observation in the growing plant.

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Spur Valerian.
Centranthus ruber.
— VALERIANEÆ. —
$^{2}/_{3}$ *nat. size.*

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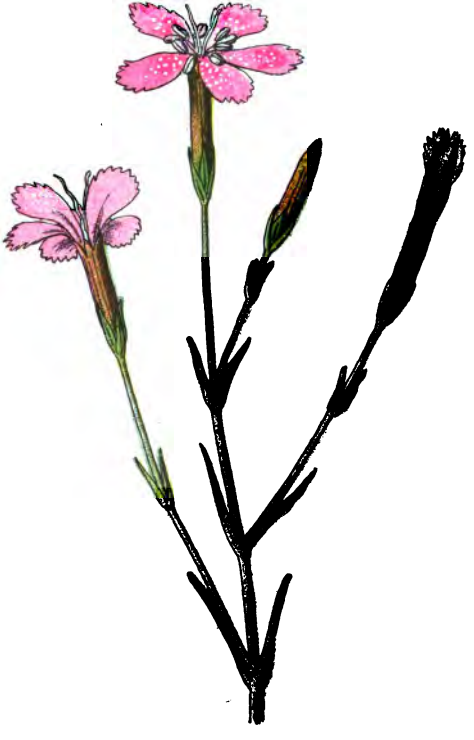

Maiden Pink.
Dianthus deltoides.
— Caryophyllæ. —
Nat. size.

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Five of the stamens emerge through the narrow mouth of the flower, mature, and the anthers open to discharge their pollen. Butterflies and moths come to obtain honey and pick up some of this pollen on their hairy bodies. Now come forth the remaining five and shed their pollen. After an interval the styles appear, and their stigmas mature, occupying such positions that if a honey-hunting butterfly has just been visiting a younger pink-flower and has any of the pollen about her, some of it is certain to be detached by these stigmas, and so cross-fertilization will be effected. Flies that come to feed upon the pollen must also assist in this work of pollen-carrying. The Maiden Pink flowers from June to September, and may be sought in fields and on banks where the soil is dry.

Name from the Greek words, *Dios*, Jove, and *anthos*, flower.

Annual Mercury (*Mercurialis annua*).

The Mercuries are nearly allied to the Spurges (see First Series, page 29), and share their poisonous qualities. That cattle are aware of this obnoxious character may frequently be seen by some shady copse-side or roadside where Dog's Mercury (*Mercurialis perennis*) is abundant, and cattle are turned out to graze. All the wholesome herbage will be closely cropped all round, but the dark-green clump of Mercury will be left untouched. The Annual Mercury (*M. annua*) does not appear to be poisonous in the same degree, for its leaves are used as a pot-herb.

Both species are erect growing, with stems from a foot to a foot and a half in height, and with opposite, stalked and toothed, oval or lance-shaped leaves. In each species the male flowers are distinct from the females; stamens and pistil are not borne by the same flower. The flowers are minute, green, consisting of three sepals, no petals, the female with a two-celled ovary, two simple styles, and two or three stamen-

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filaments, but no anthers. The male flowers contain from eight to twenty erect stamens on a central disc, with slender filaments and pendulous anthers, but no trace of an ovary.

Annual Mercury (*M. annua*) is almost free from hairiness, with opposite branches, and leaves of very thin texture (*membranous*), smooth and shining, the edges fringed with hairs. The female clusters of flowers sometimes contain a few males, but as a rule the two kinds are borne by different plants (*diœcious*). The male flowers are in loose spikes. Flowers July to October, around fields near towns and villages. It is not common anywhere; in Scotland and Ireland rare.

Dog's Mercury (*M. perennis*) is one of the common weeds of the wayside that only those genuinely interested in botany trouble to inquire about. It has a perennial, creeping rootstock, an unbranched stem, and is tolerably hairy. Male flowers in slender racemes on a long stalk; female flowers in a shorter spike, with only two or three flowers. This is a spring bloomer, the flowers appearing from March to May. The name is classical, the god Mercury being supposed to have discovered some medical virtues in these plants.

Mouse-ear Chickweed (*Cerastium triviale*).

Mouse-ear is a prefix, not only to this plant, but also to a Hawkweed (see page 52), and it is Latinized in *Myosotis*. It is really an admirable name, for the leaf of this species has much the shape of the mouse's ear at its upper part, and it is clothed with long silky hairs.

The tyro in botany sees at a glance this is a member of the Pink family; the straight joints of the stems, thickened where they connect, are sufficient to tell him this. At the joints, or *nodes*, the stalkless leaves are given off in pairs whose bases almost join, and between them encircle the stem. The flowers are gathered all together at the summit of the stem in clusters called *cymes*, where they ripen in pairs, the footstalk lengthening until it is much longer than the sepals. Under each pair of flowers there is a pair of leaf-like bracts, and the lowest of these are entirely green and opaque; but all the others have

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Perennial Mercury.
Mercurialis perennis.
— Euphorbiaceæ. —
$^1/_2$ *nat. size.*

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Mouse-ear Chickweed.
Cerastium triviale.
— CARYOPHYLLEÆ. —
Nat. size.

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a margin of thin, colourless membrane, and the five hairy sepals share this peculiar character. Within, there is a central disc, upon which five glands secrete honey for the temptation of fertilizing insects; and it also supports the stamens, and the curved cylindrical ovary, surmounted in turn by five branched stigmas. The capsule opens at the top by splitting into ten teeth and allowing the dark seeds to escape. It flowers from April to August in all kinds of waste places.

There are seven other British species, the principal ones being :—

I. Erect Mouse-ear C. (*C. quarternellum*). Smooth and free from hairs, of a glaucous tint. Sepals, petals, stamens, and styles in fours; teeth of capsule, eight. Sepals longer than petals, margins membranous. Gravelly fields, but not in Scotland. May and June.

II. Little Mouse-ear C. (*C. semidecandrum*). A familiar weed in early spring on old walls, and in other dry situations. Stem branched from the base, hairy and sticky (sometimes nearly smooth). Pedicels slightly longer than sepals. Sepals as long again as petals. Bracts and sepals half membranous. Petals appearing as though gnawed. Leaves broader at upper end. Flowers March and April.

III. Broad-leaved Mouse-ear C. (*C. glomeratum*). Similar to last, but larger. Pedicels *shorter* than sepals. Petals as long as sepals. Sepals with narrow membranous margins. Bracts not at all membranous. Curved capsules as long again as sepals. Dry places, flowering April to September. All above are annuals.

IV. Field Mouse-ear C. (*C. arvense*). Perennial. Petals as long again as sepals. Pedicels erect. Branches in tufts. Leaves crowded at base. Flowers large, pure white; capsule slightly longer than sepals. Dry sandy places; less common in Scotland. April to August.

Name, Greek, from *keras*, a horn, in allusion to capsules.

Mouse-ear Hawkweed (*Hieracium pilosella*).

Wandering over dry pastures and commons in summer we shall certainly see the flowers of this bright little weed freely distributed over the turf. Too commonly it is regarded by the non-botanical as a mere depauperated specimen of the dandelion; in fact, all low-growing yellow flowers of this type are popularly regarded as dandelions. The genus *Hieracium* is the despair of the ordinary botanist, for the splitter has been at work on it, and has made about thirty-six species out of the

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ten that Hooker gives, and which Bentham reduces to five. Of nine out of his ten Hooker says, "I believe there are no characters whereby the nine forms, from *alpinum* to *boreale* inclusive, can be more than approximately defined." So gradually do these forms merge into each other that it is impossible for the average botanist to keep the nice distinctions in mind.

Hieracium pilosella has a creeping rootstock, sending off leafy runners. The leaves are alternate, downy beneath and with long hairs scattered over the upper surface. The flower-stem is generally leafless, but sometimes has two or three small leaves upon it; its top is downy, and there are glandular hairs among the down. The flower-head is solitary, with a somewhat bell-shaped involucre, the rays of the florets smooth, pale lemon-yellow, with red or brown stripes beneath. Flowers from May to August.

There is a similar plant with orange flowers, naturalized in Scotland and the North of England, where it is known as Grim-the-Collier (*H. aurantiacum*), on account of the black hairs with which the involucre and flower-stem are clothed. It is an escape from gardens. Flowers June to August.

The name is from the Greek, *'ierax*, a hawk; it being formerly supposed that birds of prey used the juice of this plant to sharpen their vision.

Yellow-wort (*Chlora perfoliata*).

In some places the Yellow-wort is the Yellow Centaury, and, in truth, it has something of the primness of its not very distant relation *the* Centaury (*Erythræa*, see First Series, pages 78, 79). It is an annual plant that grows upon downs, heaths and banks, on chalk and clay, southward of Westmoreland and Durham. With the exception of the delicately tinted yellow flowers, the whole plant is of the peculiar glaucous hue. The somewhat spoon-shaped radical leaves form a rosette round the base of the very erect round stem, upon which there are few leaves, but these are in pairs with their bases joined, so that they completely surround the stem. This encircling of the stem

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Mouse-ear Hawkweed.
Hieracium pilosella.
— Compositæ. —
Nat. size.

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Yellow Wort.
Chlora perfoliata.
— GENTIANEÆ. —
Nat. size.

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makes it *perfoliate*, and the leaves themselves in this amalgamated state are said to be *connate*.

Yellow-wort belongs to the order Gentianeæ, but its flower-parts very readily distinguish it from other Gentian-worts, as we shall see on comparing it with Centaury, Felwort, and Buckbean. In these the flower-parts are in fours or fives, but in Yellow-wort they are in eights (sometimes six). The calyx consists of eight slender, lance-shaped sepals, with awl-shaped points; the corolla is *rotate*, consisting of a short broad tube, with eight bright yellow lobes. The ovary, with its style and cloven stigma, is bottle-shaped as a whole, but after fertilization the style drops off. The corolla would be described as *persistent*, because it keeps its hold until ruptured by the expansion of the seed vessel. Flowers June to September, opening only in sunshine.

The name is from the Greek, *chloros*, light-yellow.

The Wood Avens (*Geum urbanum*).

On the borders of woods, in copses, and on shady hedgebanks the Avens is abundant. Its leaves probably attract more attention than its flowers, for these being yellow are most likely to be put down as Buttercups. Of course, there is no real resemblance, for the Avens is a Rose, but most of the rich yellow roses—the Cinquefoils, the Tormentils, the Silver-weed—are popularly classed as Buttercups.

The Wood Avens is a perennial, with a short creeping root-stock. The radical leaves are long-stalked, the blade of the leaf broken up into distinct lobed and toothed leaflets, widely separated, and differing in size and shape; the terminal leaflet very large, the lowest ones very small. The stem-leaves are composed of three long leaflets, coarsely toothed. The stipules at their base are large and leafy, lobed and toothed. The stem may be as much as three feet in length, bearing erect

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flowers solitarily on long footstalks. The calyx has five long, pointed lobes, with five pointed bracts alternating with them The five petals are bright yellow, and spread themselves out flat, the calyx-lobes showing green between them. As in most roses, the stamens may not be easily numbered; the carpels, too, are numerous, and develop into a head of nutlets, each with a sharp hook at its tip, by which they catch in fur or feather, and so get scattered by bird and beast. The flowering period is chiefly between June and August. It was formerly called Herb Benedict, afterwards contracted to Herb Bennet, a name which still survives.

The other British species is the Water Avens (*G. rivale*); a shorter and stouter plant, more hairy; with drooping flowers of purple calyx and orange petals. Flowers May to July.

The name is from the Greek, *geuo*, to have an agreeable taste, in allusion to the clove-like odour and flavour of the roots.

Sweet Flag (*Acorus calamus*).

The Sweet Flag is very liable to be overlooked in the masses of Iris, Bur-reed, Bulrush, and similar vegetation that fringe the banks of ponds and streams. Yet once seen at the flowering time it will not be again confused with other plants. Its growth is very like that of an Iris, the thick fleshy rootstock creeping along the mud and sending down many stout roots from the under-surface, whilst from the upper-surface arise the flat sword-shaped leaves. These may be as much as five or six feet in length, and over an inch wide, with a thick mid-rib and waved margins. *Acorus* as a genus of plants is included with Cuckoo-pint (*Arum*) in the order Aroideæ, and, as will be seen on reference to First Series, page 15, the flowers of the *Arum* are arranged round a spadix, which is surrounded by an inflated envelope, the spathe. There is essentially the same arrangement in *Acorus*, though the appearance is

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Wood Avens Herb Bennet.
Geum urbanum.
— Rosaceæ. —
$^{3}/_{4}$ *nat. size.*

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Sweet Flag.
Acorus calamus.
— AROIDEÆ. —
½ *nat. size.*

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altogether different. The flowering stem is flattened and leaf-like, and from one edge of it there projects in a half-erect manner the cylindrical spadix, whilst above it like a leaf is the spathe—not inflated or spread round the spadix as in *Arum*. The spadix is three or four inches long, and closely packed with tiny flowers, each with its perianth of six oblong scales, and these with a stamen attached to the base of each. The three-celled ovary, with its styleless stigma, develops into a little berry. The whole plant is strongly aromatic, especially the rootstock, which is much used in medicine, and by the perfumer and confectioner. Flowers June and July; not common.

The name was used by the ancient Greeks for this plant, but its meaning is obscure.

White Bryony (*Bryonia dioica*).

The important order of plants which includes the Cucumber, Melons, Gourds, and Squashes has but one solitary representative in Britain—the White Bryony. Even that is confined to England and the Channel Islands, and is rare in the North of England. In the south, however, it is common in woods and thickets. It has a thick, soft-fleshed root like that of the Parsnip, but larger and branched, the flesh white. From this in spring rise several shoots covered with silvery bristles, which rapidly grow into long, trailing, rough, angled stems that scramble over hedge or bush. They effect this by means of a number of tendrils that coil spirally, and support the weak stems. The stalked leaves measure four or five inches across, and are covered with rough hairs on each side. In general outline these leaves are heart-shaped, but they are cut up into from three to seven lobes, each deeply toothed. The flowers are of two kinds, borne by the same plant: (*a*) with stamens only, (*b*) with ovary and stigmas only; sometimes on separate plants,

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as the name *dioica* indicates. The calyx and corolla are the same in both. The calyx-tube is bell-shaped, with five teeth, and the corolla of similar shape, cut into five segments of a greenish white hue marked by distinctly green veining, and hairy. The stamens are three, occasionally five. The slender style is divided into three stigmas, which are each cloven in two. The pistillate flowers develop into round berries, which become red when ripe and contain from three to six seeds. It flowers from May to September, and the annual stems die down with the first frosts.

The name is from the Greek, *bruo*, to burst forth, in allusion to its rapid growth in spring.

Yellow Loosestrife (*Lysimachia vulgaris*).

The genus to which this plant belongs is included in the Primrose order, and its best-known species is the Creeping Jenny (*L. nummularia*) of gardens and town window-sills. Another species is the Yellow Pimpernel (*L. nemorum*) of damp woods. The Yellow Loosestrife (*L. vulgaris*) differs from these trailing plants in having an erect stem, three or four feet high, arising from a creeping rootstock. The leaves are ovate, with entire edges, stalkless, smooth or downy beneath, but with black glands on the upper surface. They are opposite on the stem, or in whorls of three or four. From the axils of the upper leaves grow the yellow flowers in cymes, with slender bracts. The flower-parts are in fives or sixes. The calyx-lobes are margined with red and have hairy edges. The corolla is somewhat bell-shaped, deep yellow, dotted with orange inside, and half an inch across. The stamens are united below to form a glandular tube, and the almost globose ovary, with its slender style, develops into a round capsule that splits open at the top with five teeth. The plant grows on river-banks and wet, shady places, chiefly in England. Flowers from June to August.

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White Bryony.
Bryonia dioica.
— CUCURBITACEÆ. —
1/2 nat. size.

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Yellow Loosestrife.
Lysimachia vulgaris.
— PRIMULACEÆ. —
Nat. size.

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There is another erect-growing species, the Tufted Loosestrife (*L. thyrsiflora*), not quite so tall-growing as *vulgaris*. The leaves are dotted with black, opposite, rarely whorled; the lower ones small. The flowers are in dense, many-flowered racemes. The corolla is half the size of *vulgaris*, the lobes separated by a minute tooth. It occurs about marshy ground and on the banks of canals northward from Nottingham and Lancaster. Rare in England, more frequent in Scotland; flowering in June and July.

Wall Pellitory (*Parietaria officinalis*).

Pellitory meets us at almost every turn where there are old walls; but no one notices it, because its green flowers do not attract attention. In spite of its lack of showiness, it is worthy of notice. In an age when plants were esteemed less on account of their brilliant flowers than for their real or supposed medicinal powers, Pellitory was of good repute. It is a plant of the Urticaceæ, the Natural Order that includes the Nettles, the Elm, the Hop, and the Hemp; and it is what botanists term a polygamous plant, because its flowers may be male, female, and bisexual on one plant, or the two sexes may be on separate plants. This explanation may obviate some doubt in our examination of an individual. It is a perennial, the woody rootstock sending up annual stems, which are round, brittle, and of a reddish hue. The leaves are alternate, oval, narrowed at each end, with stalks and three main nerves. From their axils come the clusters of small green flowers, which are really clusters of clusters, for the blossoms are done up in threes or sevens, with an involucre, and these little groups are combined in the general cluster. Most of these flowers contain both stamens and pistils, but in a single involucre we shall probably find two complete flowers and one lacking stamens. The perianth of each flower is cut into four lobes, and the stamens are four. The style is thread-like, and the stigma brush-like. The stigmas are mature before the anthers. The stamens are at first curved inwards, but when the anthers are mature any slight irritation, such as the visit of an insect, will cause them

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suddenly to erect themselves with such energy that the anthers burst and discharge a little cloud of pollen. Flowers June to October.

The name is from the Latin, *parietis*, a wall, from their favourite habitat.

Woad (*Isatis tinctoria*).

Few plants are so closely connected with the history of a great nation as the Woad. Shakespeare's familiar remark that the fragrance of the Rose is not due to its name, has many applications other than to Roses; and probably the destiny of this country would in no sense have been changed had it been called Patagonia from early times. But the philologists say that the word "Briton" is derived from the Celtic *brith*, or *brit*, meaning "painted," because, as we are told by Cæsar, the ancient Britons stained their bodies with the juice of Woad, doubtless to eke out a scanty wardrobe. The conquering Saxons took the hint, and used the same juice for dyeing their garments instead of their skins, and began to import it from the Continent, and probably to cultivate it also, as is done in Lincolnshire to this day, even though the use of indigo has almost abolished the employment of Woad.

Isatis tinctoria is a tall, erect biennial herb, with a smooth stout stem, branching towards the top and attaining a height of two or three feet. Its radical leaves are more or less lance-shaped, with long stalks, whilst its stalkless stem-leaves are shaped more like arrow-heads than lance-heads. The small yellow flowers show that *Isatis* belongs to the order Cruciferæ. They are less than a quarter of an inch across, and are crowded into erect panicles. The sepals are equal at the base, and the petals equal. The footstalks continue to lengthen after flowering, and curve downwards, so that the thick-winged, brown, oblong seed-pods are all pendulous. These pods are about half

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Pellitory.
Parietaria officinalis.
— URTICACEÆ. —
1/4 nat. size.

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Woad.
Isatis tinctoria.
— CRUCIFERÆ. —
3/4 *nat. size.*

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an inch long, brown when ripe. The flowers may be found in July and August.

It is regarded as being a long-naturalized waif of former cultivation, but at Tewkesbury, on cliffs by the Severn, it is believed to be truly wild. This is the only species found in this country.

The name of the genus is the same as that used by the ancient Greeks for these plants.

Ragwort (*Senecio jacobæa*).

When we described the Groundsel and other species of *Senecio* in the First Series of this work (page 37), we briefly gave the distinguishing characters of *S. jacobæa*. The opportunity afforded by the publication of the second volume has been taken for giving a portrait of this handsome, though perhaps too abundant, species. The genus is one of the most important in point of numbers, there being about five hundred known species, of which only nine belong to Britain, though two others have got a footing here, and appear determined to maintain it.

Ragwort is a tall, erect perennial, with a stout, well-branched, leafy stem from two to four feet in height, crowned throughout the summer by the rich corymbs of bright yellow flower-heads. The general form of the leaf is that known as lyrate, but it is broken up by pinnate divisions into toothed lobes, to an extent that justifies its popular name—or we should say, one of its popular names, for it is also called St. James's-wort, Stagger-wort, and Stammer-wort. The upper leaves have no stalks, and their connection with the stem is marked by a pair of auricles. The flower-heads are about an inch across, involucre bell-shaped, rays spreading. Flowers June to October. On most plants will be found the beautiful larva of the Cinnabar

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moth (*Euchelia jacobææ*), its body consisting of alternate segments of black and orange.

The other British species not mentioned in the First Series have each undivided but toothed leaves; they are:—

I. Fen Flea-wort (*S. paludosus*), 3 to 6 feet. Rootstock short, stems leafy, erect, branched at top; leaves stalkless, cottony beneath, narrow lance-shaped, with coarse saw-teeth. Heads 1 inch across, rays numerous; in lax corymbs. June and July. Fens of Eastern counties; very rare.

II. Marsh Flea-wort (*S. palustris*), 2 to 3 feet. A biennial, with hollow, unbranched stems, downy; leaves stalkless, lance-shaped, with wavy teeth, the base half-clasping stem. Heads 1 inch or less across with short rays, pale yellow, crowded in corymbs. Flowers June and July. Fens of Eastern counties; very rare.

III. Field Flea-wort (*S. campestris*), 4 to 12 inches; leaves all radical, stalked, leathery, oval, downy, the down covered with cottony hairs. Flower heads few on a scape, with long narrow bracts, pale yellow. May and June. Dry banks and chalk downs; local.

Common Rush (*Juncus effusus*).

We have already described and figured (First Series, page 69) the Wood Rush (*Luzula*), which is own cousin to *Juncus*, the two genera forming the Natural Order Junceæ. The two groups differ most conspicuously in their leaves; those of *Luzula* being flattened, grass-like, and hairy, whilst those of *Juncus* are round, stem-like, smooth. In the common species (*J. effusus*) these leaves are all reduced to sheaths round the lower portion of the stems, as appears in the illustration. The stems are densely matted in a circular tuft; they are cylindrical, but stuffed with a continuous pure white pith, which of old served for the wicks of rush-lights. Externally they are smooth, but very finely grooved lengthwise; and grow to a height of three feet. The flowers are clustered in cymes, which are, in this species and several others, never produced at the end of the stem (*terminal*), but at the side (*lateral*) about halfway up. They are of the same lily-like type as *Luzula*—a perianth of six segments, the three outer green with a thickened midrib, the inner brown and semi-transparent. There are in this

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Ragwort.
Senecio jacobæa.
— Compositæ. —
½ nat. size.

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Rush.
Juncus effusus.
— JUNCEÆ. —
$^1/_2$ *nat. size.*

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species but three stamens, but in most others there are six, attached to the perianth segments. It flowers in July and August, and occurs in moist places on heaths, in fields and wastes everywhere. There are no less than eighteen British species.

The name is Latin for Bulrush, derived from *jungo*, to join, in allusion to its use for tying bunches of herbs and flowers.

Manna-grass (*Glyceria fluitans*).

Manna-grass will be familiar to most of my readers, though probably not by name, as a grass that grows from the shores of ponds and ditches, and sends its long thin floating stems across the water. Sometimes a shallow pool may be entirely filled by it, and considerable stretches of deep water in lakes and large ponds may be covered by it. Cattle are said not to hesitate to wade into quite deep water in order to obtain it: they are so fond of it. It has a stout, creeping rootstock, and branched stems that creep or float, rooting as they go; round and smooth. The flowering stems are about three feet in height. The lower leaves are rather short, broad and flat; the upper long. The flower panicle is from a foot to two feet in length, the stalk (*rachis*) triangular, the branches at a distance from each other. The spikelets in this species are coloured green, sometimes tipped with purple, and are erect, half-round. There are two unequal empty glumes, and the flowering glumes vary in each spikelet, the numbers ranging from seven to twenty; they are rather rough, the tips sometimes jagged. The whole plant varies according to situation, and there are several well-marked varieties recognized. It flowers in July and August, and is well distributed. There are five other species, whose specific characters we have not space to give in detail. They are :—

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I. Reed Manna-grass (*G. aquatica*), with tall, stout stem (6 feet), and much-branched panicle; spikelets yellow-green and purple.

II. Creeping Sea Manna-grass (*G. maritima*), with round, smooth stems (1½ feet), and rolled-in leaves. Panicle only 2 or 3 inches. Spikelets green or purplish.

III. Borrer's Sea Manna-grass (*G. borreri*). Stems stout, densely tufted (1½ feet), leaves short, flat. Panicle 6 inches.

IV. Reflexed Manna-grass (*G. distans*). Stem slender, tall; panicle with long branches, horizontal, or with a downward angle. Leaves broad and flat.

V. Procumbent Sea Manna-grass (*G. procumbens*). Annual, with short, stout stems; short, glaucous leaves; panicle (2 inches) green.

The name is from the Greek, *glukeros*, sweet, in allusion to the sweet seeds.

Earth-nut (*Conopodium denudatum*).

Country children know the Earth-nut well, and how to find it, but grown-up persons have mostly lost the trick. Pigs never lose this knowledge, which comes by instinct, like the art of truffle-finding; therefore this plant is as often known as Pig-nut. Other names by which it is known in different localities are Ar-nuts, Jur-nuts, Yur-nuts, Earth-chestnuts, and Kipper-nuts. It is an umbelliferous plant, but by no means a conspicuous one, as it grows amidst the herbage of woods and heaths. It has a tough, slender, flexuous stem, with few leaves, and crowned with the compound umbel of small white flowers. The leaf is divided into three parts, and each of these is cut up into a number of thread-like portions, but the general outline of the leaf as a whole is a broad wedge-shape on a slender footstalk. When first the umbels open they assume a nodding attitude, but afterwards become erect. There are no bracts, either to the partial or the compound umbels. The petals are heart-shaped with a turned-in point. The rootstock is tuberous, growing as large as a chestnut, and *brown* in tint. We have often grubbed it up and eaten it in a raw condition, but it is said to be best when boiled or roasted like a chestnut, which it much resembles. It flowers all through the summer. The name, *Conopodium*, is from the Greek words, *konos*, a cone, and *podos*, a foot, in allusion to the shape of the lobes of the flower disc.

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Manna grass.
Glyceria fluitans.
— GRAMINEÆ. —
1/2 nat. size.

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Earth-nut. Pig-nut.
Conopodium denudatum.
— Umbellifer.e. —
$^{2}/_{3}$ *nat. size.*

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This is the only British species, but in certain districts another tuberous umbellifer may be mistaken for it, the Great Earth-nut (*Carum bulbocastanum*), a rare plant, that occurs only in chalky fields in Herts, Bucks, Beds, and Cambs. This has a *black* tuber, an erect, grooved stem with many branches, small bracts and bracteoles, minute calyx-teeth, petals deeply notched. Flowering in June and July.

Bladder Campion (*Silene cucubalus*).

The Bladder Campion, or White Bottle, belongs to a group familiarly known as Catch-flies, owing to certain species being coated with short sticky hairs, to which green-fly and other small fry adhere with fatal results. We have already dealt (First Series, pages 65, 88) with the allied genus *Lychnis*, and *Silene* is very similar in structure and appearance. There is the same neatness of "habit" given by the slim round stem, with enlarged joints where the pair of leaves is given off. Bladder Campion is frequent on roadside wastes and on the margins of cornfields. It is a perennial, with a stout rootstock, and erect branching stems, rising to two or three feet. Both stems and leaves are of a glaucous tint. The bracts are thin and dry. The sepals are united to form a greatly swollen bladdery-looking calyx of grey-green colour with a network of nerves. The mouth of this bladder is cut into five teeth, to indicate the sepals of which it is composed. The five petals are each deeply cloven into two narrow segments, and just below this cleft there are two scarcely noticeable scales. There are ten stamens, but the number of styles varies from three to five. The flowers, which are numerous and gathered into a panicle, are all drooping; they are of three forms—male, female, and bisexual. June to September.

There are seven other British species, among them :—

I. Sea Campion (*S. maritima*). We are doubtful if this is entitled to specific rank. The tyro may have difficulty in separating it from *S. cucubalus*. The stems are spreading instead of erect; shorter; leaves smaller; flowers larger, one to four only in a panicle. Petals not so deeply cloven, the segments broader and the scales

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larger, more evident. Bracts green and fleshy. Flowers May to September. Rocky and sandy seashores.

II. English Catchfly (*S. gallica*). A hairy, sticky, annual p'ant; the lower leaves spoon-shaped, the upper variable. The white or pink flowers borne singly in the axils of upper leaves. Petals usually cleft slightly, small. Calyx with green, downy ribs and bristle-like teeth. Flowers June to October, in sandy and gravelly fields; often an escape from gardens.

Name from the Greek, *sialon*, saliva, in allusion to the stickiness of *S. gallica* and others.

Wall Lettuce (*Lactuca muralis*).

Our native flora comprises no less than five species of wild Lettuce, but it must not be assumed that either of these is the origin of our garden Lettuce. In this country alone this has been cultivated for nearly three hundred and fifty years, and during that period it has become so modified and run into so many varieties that it would be difficult to make out its pedigree; but it is thought the original may be looked for in *L. scariola*. *L. muralis* is the most frequent and most widely distributed of the native species, but cannot be described as an abundant weed. It is often found in the places suggested by its name, but also in the hedgerow and on rocky banks. It is a smooth annual or biennial, with tall slender stem (as much as three feet); the leaves of the pattern known as *lyrate*, or lyre-shaped, from a fancied resemblance between its outline and that of Apollo's favourite instrument. The upper part is much lobed and jagged at the edges, whilst the lower portion is greatly attenuated; its substance is dry and thin. The flower is a composite, and the heads are small, with strap-shaped outer rays of yellow hue. It flowers from June to August. The other species are :—

I. Stinking Lettuce (*L. virosa*). Tall, erect, growing as high as 6 feet. With prickly, glaucous leaves, branching stem, and spreading panicle of small pale yellow flowers. The upper leaves clasp the stem, and the few bracts have red tips. Banks and wastes, flowering in July and August. Not at all common; rare in Scotland.

II. Prickly Lettuce (*L. scariola*). Though its name signifies that it is more prickly

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Bladder Campion.
Silene cucubalus.
— CARYOPHYLLEÆ. —
½ nat. size.

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Wall Lettuce.
Lactuca muralis.
— Compositæ. —
½ nat. size.

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than *virosa*, it is only so towards the base. In other respects it closely resembles *virosa*, but the branches are more erect, the points of the leaf-lobes more distinctly directed downwards, the flower-heads smaller. Flowers July and August. Very rare; recorded only from Worcester, Norfolk, Cambridge, Essex, Kent, and Surrey.

III. Least Lettuce (*L. saligna*). Much more slender, with fewer prickles. Branches of panicle so short that the inflorescence resembles a spike. Flowers July and August. Very rare; from Suffolk and Hunts to Sussex and Kent only.

IV. Alpine Lettuce (*L. alpina*). Not prickly, but velvety. Stem stout, succulent, unbranched (3 to 4 feet). Leaves broad at top, narrowing to flat, winged footstalks Flower-heads 1 inch across, *blue*, in racemes. Flowers August, in alpine districts of Forfar and Aberdeen only.

Foxglove (*Digitalis purpurea*).

In their first year there is sufficient general resemblance between the clumps of leaves of this plant and those of the Mullein, that those who are not botanists are frequently confused. Yet a very slight examination should be sufficient to separate them accurately; that of the Foxglove, though softly downy, is thin textured compared with the thick blankety feeling of Mullein; it is also minutely wrinkled above, whilst below the network of ribs and nervures stands out in bold relief. Those from the root only are stalked; those on the stem are alternate, and gradually pass into bracts, from the axils of which the large, broadly tubular flowers droop. The corolla is usually bright purple, speckled and spotted within, but sometimes it occurs orange or yellow, more frequently white. The four stamens are in two pairs, at first with the anther-cells horizontal, but as they ripen (the long pair first) the cells assume the perpendicular position. The stigma is not mature until the pollen has been shed. The hairs in the corolla-mouth prevent the shed pollen falling out. Fertilization is effected by humble-bees who come after the honey, and their hairy bodies brush up the pollen and convey it to the stigma of an older flower. The plant is in flower from July to September, and it is a magnificent spectacle that is presented in the height of the flowering period where the Foxglove is really

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at home. It shows best on banks and woodland slopes, and we have very vivid recollections of it on scarcely accessible terraces of the sand escarpments of the Leith Hill range in Surrey. But we have seen no show equal to that of certain moorland roads in Cornwall, where it stood majestically, close-ranked, all up and over the thick rounded hedgebanks without hedges; and the eye could follow the broad masses of colour for miles. One felt that even the art of the modern landscape-gardener could compass nothing so grand in its unstudied richness of effect.

Name from the Latin, *digitale*, a finger stall or thimble, from the form of the flowers.

Corn Spurrey (*Spergula arvensis*).

The Spurrey is one of that extensive tribe of weeds of many orders that hang, so to speak, upon the heels of the farmer, and follow wherever he goes. This one will be most readily found in the cornfield on dry soils, about June, when the corn has not grown too high nor too bushy in the head to prevent one from seeing a little between the straight ranks. It represents another genus of the Pink Order, and may possibly be put down as a species of *Cerastium;* but *Cerastium* has notched petals, whilst those of *Spergula* are entire. It has straggling, downy stems, branching from the root, from a foot to eighteen inches in length, with bent joints, or knees. The leaves are half round, awl-shaped, very slender, in distant pairs, but from their association with newer leaves springing from their axils, they appear to be arranged in whorls. The flowers are minute, gathered into cymes at the ends of the stems. Now as these flowers have footstalks of varying lengths which bring them all to the same level, on the principle of the umbel, the flower-group (inflorescence) is said to be an umbellate cyme, or rather sub-umbellate cyme, because the umbel likeness is not very

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Foxglove.
Digitalis purpurea.
— SCROPHULARINEÆ. —
$^1/_2$ *nat. size.*

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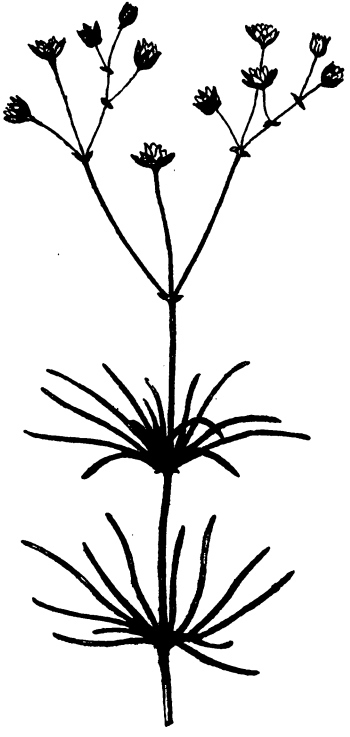

Corn Spurrey.
Spergula arvensis.
— CARYOPHYLLEÆ. —
Nat. size.

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complete owing to those flowers that have set their seeds bending down by the depression of their footstalks. The five sepals are oval, almost as large as the five white petals. Stamens ten, with roundish anthers; ovary egg-shaped, with five curved styles. It flowers from June to August. This is the only native species.

The name of the genus is from the Latin, *spargo*, to scatter or sow, from its habit of turning its capsules upside-down to disperse the ripe seeds.

Spear Plume Thistle (*Cnicus lanceolatus*).

One needs not to travel far in search of the Spear Thistle; almost any pasture, every hedgeside, and every piece of waste ground will furnish as many specimens as we need. But it is not everywhere that we have a chance of seeing it to the greatest advantage. The pasture specimens are likely to be cut off before they flower, if the farmer is at all energetic, and the roadside examples are too frequently dusty and broken; sometimes, however, we may come in our rambles upon a bit of waste that seems to have been overlooked, hidden away between the boundaries of two landowners, a kind of "buffer-state." There we shall find the Spear Thistle, and some others of the tribe, in all their glory.

Cnicus lanceolatus is a sturdy giant of its race, the stout, erect stem being frequently five feet in height, with spiny wings down either side. The lance-shaped leaves vary in length from six inches to a foot, and are deeply cut into strongly-toothed lobes, each lobe partly divided into two, and each division ending in a long sharp spine. They are bristly above and cottony beneath. The flower-heads terminate short branches, and hold themselves very erectly; the involucre egg-shaped, cottony, an inch or more in diameter, its very numerous bracts narrow, ending in long sharp spines. From the narrow end of this egg-shaped

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mass the long purple corolla-tubes break forth as a soft plume, to be succeeded by the silky down that buoys up the shining seeds in their autumnal dispersion far and wide. It flowers from July to October.

There are seven other members of the genus that trouble the British agriculturist, of which the most notable are :—

I. Dwarf Plume Thistle (*C. acaulis*), whose spreading leaves form so handsome a rosette in pastures, and whose stemless, solitary, crimson head looks so strange in the midst of the rosette. No closer description is needed. Flowers July to September.

II. Creeping Plume Thistle (*C. arvensis*). The too, too common perennial plague of the farmer, who often endeavours to suppress it by the vain method of decapitation, but its rootstock creeps extensively. Stem 2 to 4 feet, male and female flowers on different plants, in separate patches. Flowers dull purple, July to September.

III. Marsh Plume Thistle (*C. palustris*). Biennial, 2 to 4 feet, stout, spiny. Leavessoft, hairy. Flowers dark purple ; heads in leafy clusters ; scales of involucre broad, keeled, purplish. Wet places. July to September.

The name is from *Knękos*, the Greek for a Thistle.

Meadow Soft-grass (*Holcus lanatus*).

The Soft-grasses, of which we have but two native species, get their name from the woolly character of their leaves and stems, which causes them to be not highly esteemed as food-grasses. They are perennial, and, like Hair-grass, form tufts, though not so large and dense as that species. The stems are round, grooved, and leafy ; the leaves flat and soft, with short woolly hairs. The panicle is somewhat open, but the spikelets are crowded, of a yellowish-green with a pinky tinge. Each spikelet is much compressed, and contains two flowers ; the upper of the two (awned) is a male producing the three stamens only, whilst the lower one has the smooth ovary and the feathery stigmas springing directly from it. The two empty glumes, in which the flowers are enveloped, are larger, boat-shaped, sharp pointed, with strongly marked nerves (three to upper, one to lower glume). The awn of the flowering glume does not protrude beyond the empty glume. The plant grows

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Spear Plume Thistle.
Cnicus lanceolatus.
— Compositæ. —
Nat. size.

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Meadow Soft Grass.
Holcus lanatus.
— GRAMINEÆ. —
$^{2}/_{3}$ *nat. size.*

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in meadows and by the wayside, flowering from June to August.

The other British species is the creeping Soft-grass (*Holcus mollis*), with creeping rootstock. The joints of the stem are bearded with spreading hairs, and the awn of the flowering glume cannot be contained within the empty glume, but protrudes beyond. With these exceptions the plant is very similar to, though much more slender than, *H. lanatus;* it is, however, less plentiful than that species, and appears to prefer more sandy pastures and hedgebanks.

Holkos is Greek for a track or furrow, a strap or rein, and some other things which appear to have no connection with these grasses ; but it is contended that this *Holkos* is derived from *elko,* to extract, because it was formerly held to draw out thorns from the flesh.

Hare's-ear, or Thorow-wax (*Bupleurum rotundifolium*).

There are four species of these remarkable plants included in the British flora, and all are rare. The present species is usually styled the *Common* Hare's-ear, but it is only common by comparison with its congeners. It is an annual plant, with round, slender, hollow stem, from a foot to a foot and a half in height. The leaves are large and oval, the lower portion completely encircling the stem (*perfoliate*); they are distant, alternate, and glaucous ; the edges innocent of teeth or other indentation. No person who jumps to conclusions after a cursory glance, would set this down among umbelliferous plants ; the appearance of the flowers is altogether dissimilar. They are clustered in compound umbels, to which there is no involucre, but the small umbels have each from three to five very large leafy bracts that are united at their bases, and have the appearance of a corolla within which the minute yellow-green real corollas look more like anthers. Each of these tiny flowers

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consists of five petals with turned-in tips, and five stamens surrounding the two-styled ovary. The plant flowers in June and July, and must be sought on chalk-downs and in fields on a chalky soil in the southern and eastern counties.

The other British species are :—

I. Sickle-leaved Hare's-ear (*B. falcatum*). A perennial with branched rootstock. Radical leaves, with footstalks, which embrace the stem ; stem leaves curved. Umbels very small, general involucre of two to five short, unequal bracts ; those of the partial umbels (*bracteoles*) proportionately longer, with awned tips. Flowers August ; fields and hedges. Surrey and Essex only.

II. Slender Hare's-ear (*B. tenuissimum*). Annual, with solid, ribbed, and much-branched stem, as much as 1½ feet. Leaves very narrow and rigid. Umbels very small, not at extremities of branches, but in the axils along branches ; bracts and bracteoles unequal and awl-shaped. Flowers July, in salt marshes and wastes. Local.

III. Narrow-leaved Hare's-ear (B. *aristatum*). Annual, with solid, short-branching stem, not more than 8 inches ; the branches ribbed. Leaves sword-shaped, sharp-pointed, the lower ones sometimes with footstalks. Bracts, three to five, with awned points. Umbels concealed in involucre. Flowers July, on sandy and rocky banks, in Devon and East Sussex only. Very rare.

It will be useful to remember that if any umbelliferous plant be found that has the edges of the leaf entirely uncut, it must belong to this genus, unless the leaf is round with the stem attached to the centre ; in the latter case, the plant would belong to the genus *Hydrocotyle*, of which there is only one species, the Marsh Penny-wort (*H. vulgaris*).

Hedge Woundwort (*Stachys sylvatica*).

Where the hedge is high and bosky, and the hedgebank runs up from a ditch, there, among the Brambles and Bedstraws and Stinging Nettles, you are almost sure to find the Hedge Woundwort. It has many of the characters of the Hemp-nettles (see page 110), and the general habit is the same. The leaves are large, heart-shaped, strong toothed, covered with soft bristles—their stalks often longer than the blade. The stem *solid*, strong-smelling when bruised. The flowers are in whorls around the upper part of the stem, six or more in a whorl. The calyx is nearly bell-shaped, with five triangular spiny teeth. The corolla is small, of a rich dark crimson colour, the lower lipped marked with white. It flowers in June and July.

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Hare's Ear.
Bupleurum rotundifolium.
— Umbelliferæ. —
Nat. size.

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Woundwort.
Stachys sylvatica.
— LABIATÆ. —
Nat. size.

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There are four other species :—

I. Marsh Woundwort (*S. palustris*), with stouter, *hollow* stem, less coarsely hairy, the leaves narrower, with shorter stalks or stalkless, odour not so obtrusive, and the flowers of a paler tint. Flowering from July to September, on river-banks and similarly wet places.

II. Downy Woundwort (*S. germanica*). A rare plant, affecting roadsides and fields where the soil is dry; in Hunts, Oxford, Kent, and Channel Islands. Covered with long, fine, white hairs. Stalks of stem-leaves short, those of radical leaves rather long. Leaves with rounded teeth. Corolla smaller than in *S. tetrahit*, downy, pale rose-purple, with lower lip spotted. Flowers July and August.

III. Corn Woundwort (*S. arvensis*). Branching from the base, slightly hairy. Whole plant small. Flowers pale pink, marked with white; from April to November, in fields and wastes.

IV. Wood Betony (*S. betonica*). In all the preceding species the anther-cells diverge widely; in this species they lie parallel. Leaves thick, oblong, heart-shaped; those from the rootstock forming a tuft. Flowers large, corolla hairy, red-purple. Flowering June to August, in woody wastes.

The name is Greek, *stachus*, a spike, in allusion to the inflorescence.

Wild Celery (*Apium graveolens*).

This is really the plant from which the sweet, crisp stalks of our table celery have been evolved by the gardeners, though in its wild state it is acrid, coarse, and probably poisonous. The earthing-up process, whilst, by the exclusion of light, it prevents the development of the green-colouring matter, also suppresses the strong-odoured principle that is thought to be poisonous. It grows in ditches and marshy places not far from the sea, with a perennial tap-root and a stout furrowed stem about two feet in height. The large smooth leaves are either pinnate, like those of Hemlock (page 90), or divided into three wedge-shaped leaflets, which are cut and lobed, and the lower ones stalked. The umbels are compound, the flowers greenish-white, the petal tips greatly curved inwards. There are no bracts. Flowers June to August. The fruit is roundish, laterally compressed; carpels five-angled, with a solitary vitta alternating with the primary ridges.

There are two other British species, formerly reckoned as *Helosciadum;* they are :—

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I. Procumbent Marshwort (*A. nodiflorum*), 1 to 3 feet long, *not* high; stem slender, creeping, or procumbent; leaves pinnate or trifoliate, leaflets slightly lobed and saw-toothed, variable. Flowering branches, rooting at the base. Flowers small, white; petals nearly straight; umbels opposite to leaves, flower stalks short, bracts two, one, or none. Marshy places; July and August. Perennial.

II. Least Marshwort (*A. inundatum*), 4 to 10 inches long, stem stout, wavy, decumbent, or floating. Submerged leaves twice or thrice pinnate, leaflets hairlike; floating leaves pinnate, leaflets wedge-shaped, the lower cut into three; umbels opposite leaves, very small, short stalked, bracteoles four to six. Flowers white, very small, petals incurved. June and July; in wet places and pools that are dry in summer.

Yellow Everlasting Pea (*Lathyrus pratensis*).

The Everlasting Pea of our gardens, with its beautiful clusters of rosy blossoms, is not a British plant, and therefore it must not be supposed that this is its wild original. But the Yellow Everlasting Pea or Meadow Vetchling, is a very near relation, and an examination will show that it closely resembles the garden kind on a small scale. It has a creeping underground root-stock from which arise several sharp-angled stems. The leaves are each divided into two lance-shaped leaflets, with, in most cases, a short tendril springing between them. At the junction of each leaf-stalk with the stem there is a pair of very large stipules, of the arrowhead type, and broader than the leaflets. The small, bright yellow flowers are borne in bunches (*racemes*) of about a dozen, supported by a stalk an inch or more in length. The calyx is tubular, with five long awl-shaped points, and the large erect petal, called the standard, is marked with several sharp thin purple streaks. It may occur to the rambler to query what difference separates this plant from the Vetches, that it should be included in a separate genus; and we may reply that the differences are not great. In habit *Lathyrus* and *Vicia* are very similar, but *Lathyrus* has fewer leaflets and broader petals. In addition, there is a minute distinction to be based on the tube formed by the cohesion of the lower portions of the stamens; in *Vicia* this ends abruptly, but in *Lathyrus*

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Wild Celery.
Apium graveolens.
— Umbelliferæ. —
$^1/_4$ *nat. size.*

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Wild Everlasting Pea.
Lathyrus pratensis.
— LEGUMINOSÆ. —
$^3/_4$ *nat. size.*

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it is cut, as it were, on the slant. The style, too, is flattened, and its inner surface bearded. The plant is fairly common in meadow and copse, also on the tops of hedges, throughout the country, and may be found in flower from June till September.

The genus is named from *Lathuros*, the Greek name of a plant mentioned by Theophrastus. There are eight other British species.

Frogbit (*Hydrocharis morsus-ranæ*).

This pretty aquatic plant must be sought in the still waters of ditches and river back-waters, where its white and yellow petals are probably mistaken for those of the much more plentiful Crowfoot, and passed by. But, as a rule, the time of the Crowfoot's flowering has passed when the Frogbit commences her display. From the tufted appearance of the plant, as faithfully portrayed in our figure, it might be supposed that its base would be imbedded in the mud of the bottom, but that is not so. The plant, as figured, floats upon the surface, and sends out long horizontal runners, from whose joints tufts of very long roots descend, and penetrate deeply into the mud. On certain of these roots little bulbs are produced, from which new plants arise. The leaves are on long stalks, roundish-kidney-shaped, the undersides more or less reddish. The flowers consist of three small oblong sepals, and three large white petals. The stamens and pistil are in different flowers ; the stamens are twelve in number, of which, however, three or six bear no anthers. There are three imperfect styles in this male flower. The female flowers have a fleshy gland at the base of the petals, and six imperfect stamens round the egg-shaped ovary. There are six styles (agreeing with the six cells of the ovary), united at their base. The flowers are at first enveloped in a semi-transparent spathe ; the male flowers (two or three) in a stalked two-

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leaved spathe; the female solitary in a one-leaved stalkless spathe. Flowers July and August. This is the only species.

The name is from two Greek words, *udor*, water, and *charis*, beauty or delight = the delight of the waters.

Hedge Bedstraw (*Galium mollugo*), and Lady's Bedstraw (*Galium verum*).

We have already (First Series, page 87) figured and described one member of this genus, the very plentiful and sticky Goose-grass (*G. aparine*). All the species agree in having a square stem, long and slender, with the leaves and leaf-like stipules forming whorls. The calyx is very minute, almost absent, the corolla four-lobed with minute tube, stamens four, styles two.

Hedge Bedstraw (*Galium mollugo*) has long weak stems, three or four feet long, not so stiff and brittle as those of *G. aparine*, nor furnished with hooks, but smooth or hairy, the angles of stem rough or hairy. The leaves are broader than those of *aparine*, variable in form and size, with bristles on their margins, generally six to eight in a whorl. Flowers small, white, in large panicled horizontal cymes. The flowers will be found from June to August, and a favourite position for the plant is the upper part of a grassy hedgebank.

Lady's Bedstraw (*G. verum*) has stems two or three feet in length, downy; very narrow (linear) leaves in whorls of from eight to twelve, rough above, with the margins curled back, and ending in a little hard point. The flowers are yellow, in compound cymes. Fruit black. It is from the flowers of this species being used for the purpose of curdling milk that the genus has got its name, derived from the Greek *gala*, milk. The only other yellow-flowered British species is :—

Crosswort (*G. cruciata*), which may be readily identified by any one of these three points :—The leaves are broader, elliptic (1), only four in a whorl, whence the

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Frog Bit.
Hydrocharis morsus-ranæ.
— HYDROCHARIDÆ. —
$^{3}/_{4}$ *nat. size.*

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A. — **Yellow Bedstraw.** Galium verum.

B. — **Hedge Bedstraw.** Galium mollugo.

— RUBIACEÆ. —

Nat. size.

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names (2), hairy on both surfaces (3). In addition, the *few-flowered* cymes are produced only from the axils of the leaves, whilst in *G. verum*, they are both axillary and terminal. Flowers April to June.

The genus contains eleven British species in all.

Tufted Hair-grass (*Deschampsia cæspitosa*).

This is the tall-growing grass which forms such dense elevated tussocks on boggy land, and to which we have often acknowledged our indebtedness for dry feet when searching for bog-plants. It is a perennial grass, growing to a height of from four to six feet, with stout leafy and glossy stems. The leaves are leathery, flat, and rough. The flowers are in a nodding panicle, with spreading, waving branches. The spikelets a quarter of an inch long, flattened from the sides (*compressed*), polished, and of a yellow-brown or purple hue; two flowers in each. The empty glumes nearly equal, keeled and polished, with a double tooth at the apex. The flowering glumes from one to three (of which the third is always imperfect), longer than the empty ones, with a silky base, and a short awn inserted in the back below the middle. The pales are narrow and two-nerved; scales lance-shaped. There are three stamens and two feathery stigmas. It occurs in wet meadows, bogs, woods, the borders of fields, and moist shady places generally, varying according to situation, and flowering in June and July. Its presence in the meadow is not welcomed by the farmer, for it is of too wiry and coarse a nature.

There is another species, the Waved Hair-grass (*D. flexuosa*), in which the slender erect stems are but two feet in height; and the leaves short, thread-like, round and solid, but grooved, and growing in an arched manner. The spikelets are half round. The empty glumes are not notched at the apex, but end in a point. The awn is first erect, then bent or twisted. This affects

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drier places in woods and on heath-banks, flowering from June to August.

The genus is named after Dr. H. Deschamps, a French botanist.

Prickly Saltwort (*Salsola kali*). Plate 78.

Among the queer forms of vegetation one commonly meets on sandy seashores, and in salt marshes, is a plant with glaucous, much-branched, angular and brittle stems, furrowed and striped and bristly. Its stem and branches spread all around, so that it forms a clump about two feet high. The fleshy leaves are rough, awl-shaped, with broad prickly bases partly clasping the stem, and spiny points turned back. The small pale-green flowers are borne in the axils, and are stalkless; one, two, or three form a cluster, and are accompanied by a pair of spiny, leaf-like bracts. The perianth consists of five sepals, enclosing five stamens, a globose ovary with two styles. After flowering there develops across the back of the sepals a broad or narrow wing, dry and translucent, and often of a rosy hue. The plant is an annual, that flowers in July and August. It is the only British species, and is often called Glasswort.

Formerly *Salsola* was an important plant commercially, for it yielded barilla, an impure carbonate of soda used in the manufacture of soap and glass, but now that soda can be so cheaply produced chemically from common salt, the demand for barilla has become a small thing. For this purpose the plants were dried in the sun, then laid in heaps on a grating and fired, when the alkaline matters they contained melted out and flowed into a hole beneath the grating.

The name is from the Latin words, *sal*, salt, and *solum*, the soil, from the habitat of the plant.

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Tufted Hair Grass.
Deschampsia cæspitosa.
— GRAMINEÆ. —
$^1/_2$ *nat. size.*

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Prickly Saltwort.
Salsola kali.
— Chenopodiaceæ. —
$^1/_2$ *nat. size.*

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Bog Asphodel (*Narthecium ossifragum*). Plate 79.

The Asphodel is another of the beauties of bogland. It is a small plant, with a long creeping rootstock and stiff, sword-shaped leaves, with sharp flat points, and distinct ribs. These leaves are usually four or five inches in length, but may be as much as a foot. They are all radical, except that occasionally there may be one or two smaller ones half-clasping the otherwise leafless stems. The flowers are golden yellow, arranged in a raceme. Individually they consist of six perianth-segments, green outside and yellow within. Under the influence of sunshine these spread open widely; and as they remain attached after the fruit has ripened they make a brave show in the bog for a considerable space of time. There are six stamens, whose awl-shaped filaments are white and hairy, the anthers orange. The ovary is narrow and triangular, with a short style; it develops into a three-sided red capsule. The flowers may be found in July and August, and it is fairly common on wet moors and in boggy hollows on hillsides, where the Sundews, the Marsh St. John's-wort, the Cotton-grass, and many another bog plant grows, with the Cross-leaved Heath close at hand. It is widely distributed, vertically as well as horizontally, for it occurs at an elevation of over three thousand feet in the Highlands. It is the only species.

The name of the genus is from the Greek, *narthekos*, a reed or cane, which can only refer to the flower-stem. Its second or specific name means "bone-breaker," and without some explanation this may seem obscure. Sheep pastured in the places where this plant grows are very like to contract the rot, and formerly the mischief was debited to the plants growing there. The Marsh Pennywort therefore got the alternative name of White Rot, and Asphodel got the appellation in Latin of "bone-breaker."

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Hemp Agrimony (*Eupatorium cannabinum*).

This plant, which is better known in Cornwall as Black Elder, is rather fine when growing in a wood apart from other undergrowth, or on the banks of the river where it has room to show itself; but too often it is crowded up in a dense mass of hedgerow vegetation, each plant elbowing its neighbours and struggling up to the light. In such a position all character is lost, and we see little beyond the great masses of dull purple flower-heads. It has much of the erect habit of the hemp (*Cannabis*), and the leaves provide a further resemblance. It is a perennial, with a woody base to its rounded, downy stems, which are branched only at the top. The opposite leaves are broken up into three or five lance-shaped, saw-toothed leaflets, which are from two to four inches long. The flower-heads are gathered into dense corymbs, which terminate the flowering branches. The involucral bracts are narrow, dry, and translucent.

The flower-heads might slightly puzzle the botanical tyro, for at first sight they do not appear to belong to the great Composite order. This is due to the fact that very few flowers are included in each head, that they are all tubular, none ligulate, and that the involucre is so much shorter than the florets. It is, in fact, the simplest of our composite flowers, each head consisting of five or six florets only. These viewed individually will be found to have the mouth of the tube cleft into five lobes, and to contain five anthers and a long branched style, nearly twice the length of the floret. The flowers will be found from July to October, in the situations mentioned, provided the soil is damp. It is somewhat rare in Scotland, and is not found north of Sutherland; it is abundant in the South of England. This is the only British representative of a genus containing about four hundred species, mostly American.

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Bog Asphodel.
Narthecium ossifragum.
— LILIACEÆ. —
Nat. size.

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Hemp Agrimony.
Eupatorium cannabinum.
— Compositæ. —
$^1/_2$ *nat. size.*

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Eupatorium was the classical name for the plant, said to be so-called after Mithridates Eupator, King of Pontus, who first discovered its medicinal virtues.

Sea Sedge (*Carex arenaria*).

Of the large and difficult genus Carex not less than five hundred species are known, and of these the considerable number of sixty inhabit these islands. No reader would wish us to fill a large number of pages with the specific characters of these; we have, therefore, thought it well merely to give a description of the common species selected for illustration, and one other. With this aid, meagre though it be, we trust our friends will at least be able to detect a Sedge when they meet it, though they may not be able to determine the species. The genus Carex is included in the great order Cyperaceæ, and of this order we have already given example in the Cotton-grass (page 17), to which it would be well again to turn. Further on (page 43) will be found another representative in Bulrush (*Scirpus*). So far as general structure of stem, leaves, and flowers is concerned, the Sedges will be found to be similar to Cotton-grass, with important differences separating these into distinct genera. There is the same solid triangular stem, the leaves at their lower half forming closed shutters round the stem; but whereas the flowers of Cotton-grass each contained both stamens and pistil, those of *Carex* bear these organs in separate flowers. Again the spikelets agree with Cotton-grass in being many-flowered and rounded; but the flowers have no perianth whatever, not even one of bristles. The male flower consists of a glume, to the inner face of which three stamens are attached; the female is usually a triangular ovary, surrounded by a flask-shaped sac, from which the two or three stigmas project. This sac is called a *perigynium*.

I. Sea Sedge, or Mat-grass (*Carex arenaria*), has a thick, creeping rootstock, short stems, about 1 foot, three-cornered, curved, rough above; leaves rigid, but

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curved, chiefly from the root, the margins rolled inwards. Spike 1 to 3 inches, brown; spikelets numerous, the upper ones containing male flowers, the lower female, and some intermediate ones containing flowers of both sorts. The ovary develops into a little nut, in this species flat on one side, rounded on the other, chestnut-coloured, and glossy. Flowering in June, and found chiefly on sandy shores, which it largely helps to hold together. It is also found in a few sandy places inland.

II. Hare's-foot Sedge (*C. leporina*) has a tufted rootstock, with stems of similar shape and size to the last, though not quite so rough above. Leaves narrow, finely pointed. Spike not more than 1 inch, pale brown, flattened; spikelets male at the base only, above female. The glumes pale brown, with a green midrib, whitish edges, and a two-pointed and toothed beak. Perigynia not stalked. Nut on a short stalk, oblong, lens-shaped, glossy. Wet places. June.

Name from the Greek, *keiro*, to cut off, from the sharp edges of the leaves.

Great Mullein (*Verbascum thapsus*).

This is the Common Mullein, the Hig-taper of our Saxon forefathers. The latter name is one that has been much and variously explained. It has been spelled *high* and *hag;* high, it has been said, because dipped in melted grease, and used as a torch or taper at high festivals of the mediæval church; hag because the witches were fond of it. The truth is, hig is only a corrupt spelling of the Saxon *hæg*, hedge, and taper is a very appropriate name for the tall plant with its flame-like spike of golden flowers. All five British species of Mullein are usually biennials, with leaves more or less woolly. In the Great or Common species, which is also called Torch-blade, the leaves are exceedingly shaggy. Those from the root are very large, broadly lance-shaped, more than a foot long, but as we look up the stem we see each higher leaf smaller than the one next below it. The stem-leaves have their edges continued for some distance down the stem, and are therefore *decurrent.* During the first year of the plant's life it has no ascending stems; this comes not until the Mullein is preparing to flower in the second year, when it runs up to four or five feet in height, and finishes in the flower-spike. The flowers are five-parted, the corolla *rotate*, with five nearly equal lobes, an

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Sea Sedge.
Carex arenaria.
— Cyperaceæ. —
1/1, *nat. size.*

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Great Mullein.
Verbascum thapsus.
— SCROPHULARINEÆ. —
Plant $^1/_6$; *flowers* $^1/_4$ *N. S.*

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inch across, and woolly outside. We have already called attention to the fact that the plants of the order Scrophularineæ, though the calyx and corolla are five-parted, have only four stamens; but the genus *Verbascum* is exceptional, in so far as its members have five stamens. In the common species the two long stamens have smooth filaments, but the filaments of the shorter ones are bearded with white hairs. Flowers from June to August in dry wastes. The other species are :—

I. White Mullein (*V. lychnitis*). With angled stem, 3 feet. Radical leaves, stalked, lance-shaped, white beneath only. Flowers small, whitish, in narrow racemes. July and August.

II. Hoary Mullein (*V. pulverulentum*). Mealy, with round stem and velvety leaves. Similar in habit to *lychnitis*, but radical leaves broader, stalkless; stem leaves heart-shaped. Flowers bright yellow. July. Norfolk and Suffolk only.

III. Dark Mullein (*V. nigrum*). Perennial. Stem angled, 2 to 3 feet. Whole plant covered with long, woolly hairs, but not so matted as in last species. Radical leaves, stalked. Flowers yellow, stalked, in racemes. Hairs of anther-filaments purple. June to October.

IV. Moth Mullein (*V. blattaria*). Nearly smooth. Stem slightly angled, slender, 1 to 4 feet. Flowers bright yellow, sometimes cream-coloured, filament hairs purple Rare. June to October.

Name altered from the Latin, *barbascum*, from *barba*, a beard.

Sea Holly (*Eryngium maritimum*).

Almost without exception the British species of the order Umbelliferæ have flowers white or yellow; the solitary exception is *Eryngium*, whose colour is pale blue. The plant would be a good one to test the thoroughness of a botanical student's methods. The superficial observer to whom a specimen is handed will probably declare it to be a Composite of the thistle section or a teasel. Our readers, however, will readily satisfy themselves that it is a genuine umbelliferous plant by separating the flower-cluster and examining the flowers. They will find that the foot-stalks of these flowers have been suppressed, so that they form dense heads with a conspicuous whorl of rigid and spiny bracts. Looked at more minutely, the calyx-

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tube will be found to be scaly, with sharp teeth longer than the petals; the petals are narrow, and deeply notched, with a long point turned over towards the centre of the flower.

The stature of the plant is from a foot to two feet, rising from an extensively creeping perennial rootstock, which gives off rooting branches. The radical leaves are nearly round, from two to five inches across, with a tough, hard margin and spiny lobes; those of the stem are more fully lobed in a palmate manner, but equally rigid and prickly, and the same character attaches to the bracts beneath the flower-heads. The whole plant is of that glaucous hue that is so common among our maritime plants. It flowers in July and August, and should be sought on sandy shores around our coast, where it is common. Other names by which it is known are Sea Eryngo, Sea Hulver, Sea Holm.

The only thing clear about the etymology of the word *Eryngium* is that it is a slightly altered form of the name used by Dioscorides, *eruggion;* but its significance is uncertain. Formerly it had high repute medicinally, and for this reason the roots were candied, and taken as a restorative and stimulant.

Sea Milkwort (*Glaux maritima*).

On the low rocks that are splashed with spray at high water, where we found the Samphire (see page 42), we shall in all probability find considerable quantities of Sea Milkwort, or Black Saltwort, as it is alternatively named. It is not a very well-known plant, but there is no reason why it should not be, for it occurs abundantly not only on the seashore, but also in estuaries, and even in the inland salt-districts. On the Cornish coast it grows with its tough root-stock wedged between the layers of the slaty killas-rock. It is not a tall-growing plant, its stem being only a few inches in height, and its leaves small,

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Sea Holly.
Eryngium maritimum.
— UMBELLIFERÆ. —
Nat. size.

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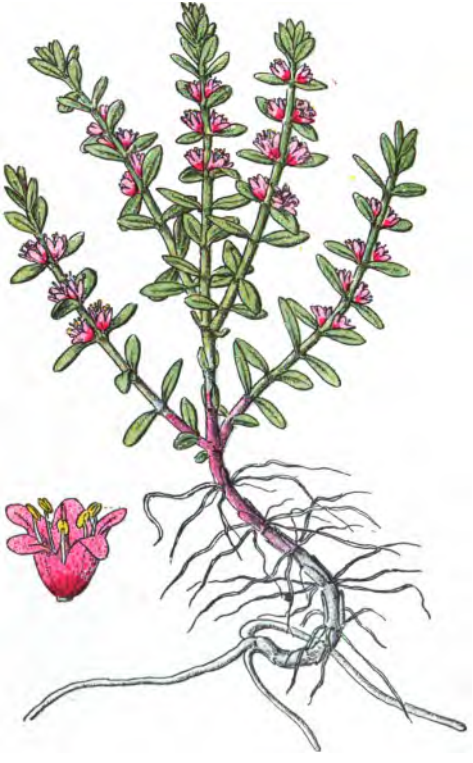

Sea Milkwort.
Glaux maritima.
— PRIMULACEÆ. —
1/2 nat. size.

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smooth, stalkless, and, like so many other shore-plants, thick and fleshy. Their margins are quite even, without teeth or lobes of any sort, and they are minutely pitted all over; the upper surface much darker than the underside, but of the blue-green hue that has given its Greek name to it, derived from *glaukos*, blue.

Examined closely the flowers will be seen to have no petals, but the calyx, which is bell-shaped, with five lobes, is coloured with a flesh tint, finely sprinkled with minute crimson dots. It blossoms from May to August, and its flowers are succeeded by globose fruits, similar to those of the Primrose and Pimpernel; it is, in fact, one of the Primrose family. There are no other British species.

Corn Mayweed (*Matricaria inodora*).

Our illustration will seem to be that of a plant with which all are familiar; but it may not be the same, for there are several plants whose leaves and flowers, on a cursory glance, are alike, but to the botanist there are striking differences. We may take three Composite plants—this, the Chamomile, and the Stinking Chamomile—and at a slight distance they are alike, but a touch will assure the non-botanist of their difference. Corn Mayweed gives no perceptible odour; the Chamomile exhales that sweet aromatic flavour identified with its name; whilst the Stinking Chamomile responds to the touch with a fœtid smell, and should our skin be very delicate, with a blister also.

The Corn Mayweed (often called Scentless Mayweed) is an annual, with many soft, green branches, well-clothed with alternate stalkless leaves. These look as though they had been designed for a submerged aquatic plant, they are so finely cut up into many exceedingly slender segments. Although these leaves appear a regular tangle on the plant, if one be taken off and the divisions spread out, it will be seen that there is a very

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distinct *pinnate* arrangement, and that the segments are themselves pinnate. The head of flowers is large, two inches across, supported by a long, smooth stalk; the ray-florets large, white, ultimately drooping, and the yellowish disc convex. The involucral bracts are edged with brown. In fields and hedges, flowering from June to October. Not aromatic. The only other British member of the genus is :—

The Wild Chamomile (*M. chamomilla*), which is very similar to the last. The flowers are smaller (½ to ¾ inch), borne in a corymb; rays short, blunt; disc *conical*; involucral bracts without brown edges. The leaves, when touched, give off a sweet odour similar to, but fainter than, the true Chamomile (*Anthemis nobilis*) (see First Series, pages 46, 47). Flowers from June to August in fields, etc.

The name is from the Latin, *matrix*, the womb, from its former repute as a remedy in uterine affections.

Musk Thistle (*Carduus nutans*).

Thistles of the genus *Carduus* are annuals or biennials, and are therefore more under the control of the agriculturist than are the perennial species, like *Cnicus arvensis*, that creep extensively under his permanent pasture, and laugh at his futile efforts at extermination with a sickle. But then, again, it so happens that the three British thistles included in this genus do not trouble the farmer much, having less fondness for fields than for exposed moorland wastes and sheltered hollows of the rolling chalk-downs. We have in our mind's eye such a hollow in the North Downs, that was in August one of the most brilliant wild-gardens of Nature's own planning that one could hope to see. There were long yellow spikes of Wild Mignonette, and richer golden ones of Agrimony, airy sprays of Dropwort, bright blue Chichory, and many other lowly plants, whilst towering high above them in the shade of the straight beeches were the bold glaucous foliage and lavender flowers of the Opium Poppy, and the equally bold but darker leaves and large crimson flower-heads of the Musk Thistle.

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Scentless Mayweed.
Matricaria inodora.
— Compositæ. —
$^2/_3$ *nat. size.*

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Musk Thistle.
Carduus nutans.
— Compositæ. —
$^{2}/_{3}$ *nat. size.*

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It is the prevailing habit of the Musk Thistle to grow erectly, without a branch, to a height that varies from two to five feet; its stem grooved, winged and spiny, a condition which is helped by the leaves extending partially down it, and investing it with their long spears. Wings interrupted. The large flower-head—the largest among our native thistles—hangs on its curved stalk in a drooping manner that has suggested its name of *nutans*. It is a fine object even before its flowers open, for the prickly bracts of the involucre are covered with a regular mesh of webbing, as though some industrious spider had been working upon it. When the flowers open, the bright crimson heads measure two inches or more across, and give out an agreeable scent which has been compared to musk. It flowers from June till the end of September. The other species are :—

I. Welted Thistle (*C. crispus*). With small heads in clusters. Stem 1 to 3 feet, branched, cottony. Wings continuous. Leaves lobed, cottony beneath. Flowers purple or white. June to August, in hedgerows and wastes.

II. Slender-flowered Thistle (*C. pycnocephalus*). Stem 1 to 4 feet, with continuous wings, branched, hoary. Leaves with broad, toothed lobes. Bracts of involucre few; spines turned back. Flower-heads small, in clusters. Flowers pale purple. June to August. Sandy wastes, especially near coast towns.

Burnet Saxifrage (*Pimpinella saxifraga*).

This is another of those troublesome umbellifers which the beginner in botany finds so difficult to determine, on account of the strong family likeness running from genus to genus. He has not even got differences of colour to help him in the discrimination of the species, for, with very few exceptions, white is the ruling colour throughout the order. The best characters are to be found in the fruits with their ridges and *vittæ*, as we have more fully explained at page 117. Unlike so many umbellifers that prefer a moist situation, the Burnet Saxifrage is a perennial plant of the dry upland pasture. It has a slender round stem, furrowed, and branching, one to three feet high. The radical leaves are pinnate

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with from four to eight pairs of variable, almost round leaflets, which may be merely saw-toothed, cut into lobes, or deeply in a pinnate fashion. The few stem-leaves have the leaflets again pinnate, so that the whole leaf is *bipinnate*, with very narrow divisions of the leaflets. The flat-topped umbels appear in July, and consist of small white flowers, with petals deeply notched and a long point turned inwards. The fruit is broadly oval, smooth, with the two short stigmas curved outwards. A transverse section through the fruit shows each carpel to be five-sided, with slender ridges, and many *vittæ* in the furrows between.

There is another species, the Greater Burnet Saxifrage (*P. magna*), which is very similar to the first-named, but much larger. The stem, which is from three to four feet high, is not round but angular. The leaves are all pinnate; the leaflets of radical leaves broad, oval, somewhat heart-shaped; those of the stem leaves narrower than those of the radical, but larger than the corresponding parts in *P. saxifraga*. It flowers in July and August.

According to Linnæus, *Pimpinella* is a corruption of *bipennula*, a name suggested by the bipinnate divisions of the leaf.

Branched Bur-reed (*Sparganium ramosum*).

On the margin of a big pond or small lake, hidden maybe among the woods, the botanist finds abundant material for study. So many species of different orders and genera are there, that, if he is just starting a herbarium, he will probably take away more specimens than he can properly attend to at once. Among these will probably be one or other of our three species of Bur-reed, most likely the one we have chosen for illustration, as it is the most widely distributed. They are perennial plants, with creeping rootstocks, and long, narrow, bayonet-shaped leaves with blunt tips. *S. ramosum* has a branching, erect stem, as much as four feet high, with leaves sometimes five feet long, three-sided at the base and an inch across. There are long narrow bracts on the stem, and from their axils rise the flowering branches. The flowers form

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Burnet Saxifrage.
Pimpinella saxifraga.
— Umbelliferæ. —
½ nat. size.

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Bur Reed.
Sparganium ramosum.
— TYPHACEÆ. —
$^{3}/_{4}$ *nat. size.*

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globose heads, of which it will be seen there are two sorts; the upper, smaller, and olive-coloured ones being the male flowers, whilst the lower and larger are the female heads. Individually, the flowers composing these heads consist of a perianth of three or six thin, spoon-shaped scales. In the male flowers there are two or three stamens, and in each flower of the female-head there is a one or two-celled ovary, which develops into a pear-shaped *drupe*—that is, a fruit like a cherry, fleshy without, and hard within. The flowers will be found in June and July, and the plant affects the banks of ponds, ditches, and streams. The other species are :—

I. Unbranched Bur-reed (*S. simplex*). Stem erect, 2 feet, unbranched. Flower-heads in a raceme; male pale yellow, stalkless; female on footstalks. Drupes stalked, narrow at each end. June and July.

II. Floating Bur-reed (*S. natans*). Stem limp, leafy, upper part floating, partially erecting itself when in flower. Leaves floating. Flowers similar to *simplex*, of which this plant may be a sub-species. July and August.

The name is from the Greek, *sparganon*, a swathing-band, in allusion to the shape of the leaves.

Horned Poppy (*Glaucium luteum*).

Although this yellow Horned Poppy is separated by botanists from the genus that includes the Corn Poppy and others, it is included in the Order Papaveraceæ; and those who do not call themselves botanists, yet love flowers, can tell almost at a glance that it and the true Poppies are related not very distantly. It is a plant of sandy seashores, where it forms one of the most striking items of the vegetation. Though only an annual plant (occasionally perennial), it contrives to flower for about five months. Its branching stems spread in all directions, and the blue-green, roughish leaves are large and boldly lobed and cut, clasping the smooth stem by their bases. The bright yellow flowers are three or four inches across. The two concave sepals are thrown off when the flower opens, just as in Papaver; and the four golden-yellow

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petals form two pairs, one larger than the other. The ovary is long and narrow, the two-lobed stigma stalkless. The ovary develops into a long, two-valved pod, from six inches to a foot in length. The petals, like those of the Poppy, are crumpled in the bud, and soon fall off after they have become properly expanded. The leaves, like those of most shore plants, are thick and leathery in character. The plant attains a height of two feet. It is the only British species, and does not occur in Scotland north of the Forth and Clyde. Flowers June to October.

The name is from the Greek, *glaukos*, blue, in allusion to the blueness of its green.

Curled Dock (*Rumex crispus*).

We all know the Dock of ditch and roadside waste, but few have any appreciation for it, except the artist, who finds in it an always handy clump of bold foliage for his foreground. How many of us, even among flowers-lovers, could distinguish between several common species and say, "This is Curled Dock, and that is Broad-leaved Dock, and the other is Fiddle Dock?" Why, most of us, when we speak of Dock, mean Dock, and reck not of any difference of sorts. Yet botanists have sorted them out for us, and tell us there are nine British species, not reckoning the two small species of *Rumex* that are known as Sorrels. So familiar is the general appearance that we shall not waste much space in describing it, but deal more with the specific differences. They agree in having stout rootstocks, large alternate leaves, grooved stems, flowers that are individually inconspicuous, because wind-fertilized, but being grouped in whorls and these in panicles, their clusters are familiar to us. Briefly the flowers may be said to consist only of six sepals (the three inner larger than the outer), no corolla, six stamens, and a three-sided ovary, with three styles and brush-like stigmas.

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Yellow Horn Poppy.

Glaucium luteum.

— PAPAVERACEÆ. —

$^2/_1$ *nat. size.*

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A. — **Curled Dock.**
Rumex crispus.

B. — **Sheep's Sorrel.**
Rumex acetosella.

— POLYGONACEÆ. —

½ nat. size. *Nat. size.*

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I. Curled Dock (*Rumex crispus*). The most widely distributed species. Leaves much waved and crisped at edges. Stem 3 feet, branched; panicles leafy below, with erect branches, whorls crowded. Mature sepals green or reddish; inner with a small, smooth tubercle on midrib. Waste places. June to October. (Plate 90.)

II. Blood-veined D. (*R. sanguineus*). Leaves contracted near middle, so as to be fiddle-shaped, heart-shaped at base, nerves red or green. Stem 4 feet, panicle leafless, whorls distant; outer sepals with large, globose tubercles. Roadsides and hedges. July and August.

III. Sharp D. (*R. conglomeratus*). Closely resembling No. II., but leaf never contracting above base. Panicle leafy almost to top. Inner sepals with oblong tubercles. Wet meadows and wastes. June to October.

IV. Great Water D. (*R. hydrolapathum*). Stem branched, 6 feet. Leaves 2 feet, broad, lance-shaped. Panicle large, almost leafless, whorls crowded, all the sepals with oblong tubercles. Ditches and riversides. July and August.

V. Aquatic D. (*R. aquaticus*). Stem very stout, 3 feet. Leaves crisped and waved. Panicle with erect branches, whorls united, inner sepals heart-shaped, green, with network markings and thickened midrib, no tubercles. Ditches and wet meadows. July and August.

VI. Broad-leaved D. (*R. obtusifolius*). Stem stout, 3 feet. Leaves broad, blunt, margin waved. Panicle narrower, inner sepals long, bluntly triangular, strongly toothed at base, tubercle long. Fields and wastes. July and August.

VII. Meadow D. (*R. acutus*). Similar to No. VI., but leaves narrower, inner sepals broader, teeth more numerous, shorter, and near the top. Roadsides and wastes. June and July.

VIII. Fiddle D. (*R. pulcher*). Stem 2 feet, wavy, with slender branches. Leaves fiddle-shaped, soon withering. Panicle leafy to top, with spreading branches, whorls distant, inner sepals oblong, deeply toothed to middle, tubercle oblong, rough. Dry wastes. June to October.

IX. Golden D. (*R. maritimus*). Stem 2 feet. Leaves very narrow, yellow-green, margins slightly waved. Panicle leafy to top, flowers excessively crowded, whorls united, inner sepals bright orange-yellow, with two or four long teeth. Marshes chiefly near sea. Rare. July and August.

[The two Sorrels differ from the Docks in having the leaves halberd or arrow-shaped, and the male flowers borne on a different plant from that which bears female flowers; technically, they are dioecious plants.]

X. Sorrel (*R. acetosa*). Lower leaves arrow-shaped (*sagittate*); rootstock slender, tufted. Male flowers in dense whorls. Acid; used as salad and pot-herb. Radical leaves, 3 to 6 inches. Flowers May to August.

XI. Sheep's Sorrel (*R. acetosella*). Rootstock creeping, branched. Lower leaves halberd-shaped (*hastate*), turning bright red towards autumn, 2 inches long. Acid. Flowers May to August. (Plate 90.)

Rumex **is the old Latin name for Sorrel.**

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Bent-grass (*Agrostis vulgaris*).

The Fine Bent or Red-top (*Agrostis vulgaris*) is common everywhere; meadows and marshy places, pastures and hedge-banks, alike afford specimens. It is a perennial grass, with short, flat, harsh leaves growing from a much-branched, creeping rootstock. The flower-panicle is a drawn-out oval in outline, but subject to considerable variation. The spikelets are very small; the two empty glumes nearly equal, but the upper smaller than the lower, oval or lance-shaped, nearly smooth, dull red or greenish purple, sharp-pointed; flowering glume somewhat less, blunt, three-nerved; pale, two-nerved, one-third the size of flowering glume. Flowers June to September.

There are three other British species—Dog Bent (*A. canina*), which dogs and cats use as an emetic; Bristle-leaved Bent (*A. setacea*); and Fiorin-grass (*A. alba*).

The name of the genus is an old Greek word applied to grasses, from *agros*, a field.

Hemlock (*Conium maculatum*).

This is supposed to be the same plant as that which supplied the state poison of Athens, by which Socrates was put to death. Like the Sanicle, it is an umbelliferous plant, but it lacks the aromatic qualities so general in umbellifers when bruised, and, instead, gives forth a fœtid mousy odour. It has a biennial or perennial tap-root, like the Carrot, and a smooth stem more or less spotted with purple, with many branches from the upper part. The leaves are alternate, large, wedge-shaped, compound, and very fern-like, for the leaflets are opposite, distant and themselves deeply cut in a pinnate manner. The small white flowers are in small umbels, and about a dozen of these are gathered into one large terminal compound umbel. In distinguishing this species from its allies, it is well to note that at

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Bent Grass.
Agrostis vulgaris.
— GRAMINEÆ. —
$^1/_2$ *nat. size.*

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Hemlock.
Conium maculatum.
— Umbelliferæ. —
½ nat. size.

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the base of each little umbel there are three short bracts, all turned to one side (*unilateral*). The involucre of the general flower-cluster is composed of many bracts, more equally disposed. The tips of the petals are turned over inwards. The seeds are in pairs, their inner faces flat, their outer form hemispherical, with thick, prominent, and wavy ridges. Flowers June and July. This is the only British species, and it will be found generally distributed, growing in all sorts of waste-places, and attaining a height of from two to five feet.

As already indicated, the name *Conium* is the same as that used by the ancient Greeks for the plant, and the word is said to be derived from *konos*, a cone or top, whose whirling is suggestive of the vertigo produced in the human subject by the juices of Hemlock.

Marjoram (*Origanum vulgare*).

The name and the figure recall visions of high, rounded banks to a deep lane in the chalk districts of Surrey, when the hot air of July is heavily laden with the sweet aromatic odour of Marjoram, and the banks densely clothed with the plant, and its broad bunches of purple flowers swarming with long-winged beetles.

A glance at the illustration shows this to be a true Labiate in all its details. It has a short rootstock, from which runners proceed; the leaves have short stalks, and are usually entire, but sometimes have blunt teeth. The calyx is dotted with yellow, and has short teeth. The corolla is ordinarily purple, but on some plants the flowers are much smaller, and also of a paler tint. The larger kind bear both stamens and pistil, the stamens maturing first (*proterandrous*) to ensure cross-fertilization. In the smaller kind only the pistil is developed, and here again, of course, cross-fertilization must take place; the species, in fact, has entirely lost the power of self-fertilization, but the

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showy heads of bloom, the abundant honey, and the aromatic odour quite do away with the necessity for it, for insects swarm upon it, and unconsciously perform the task of pollen-carriers. The plant flowers from July to September. This is the only British species, and the name is made up from two Greek words, *oros*, a hill, and *ganos*, brightness, from its giving brightness to hilly places.

Common Water Dropwort (*Œnanthe fistulosa*).

A beautiful species of *Spiræa* that grows upon chalk-downs is *the* Dropwort, and the reader is warned against confusing the names. That is one of the great Rose family; this is an umbellifer like Hogweed, Hemlock, and Celery. *Œnanthe fistulosa* is the most common of the six British species, though not so widely distributed as *Œ. crocata*, and may be found in most ditches, rivulets, and marshes throughout England, Ireland, and Southern Scotland. It is a perennial plant, with fleshy fibrous roots, that burrow deeply into the mud, and are often swollen and tuberous. The rounded stems, too, and the leaf-stalks are swollen and hollow (fistular). The leaves are pinnate; those from the root with small wedge-shaped segments, those from the stem with the segments few and much narrower. Only the upper portion of the plant is shown in our plate, with the fruit instead of the flowers. The umbel terminating the stem (which is two or three feet high) consists of three partial-umbels of tiny white flowers, all of which are fertile; but the branches bear umbels with a greater number of parts and sterile flowers. The individual fruits are about a quarter of an inch long, angular, with the two spiny styles still attached. The flowers may be found from July to September.

The more common of the other species are :—

I. Parsley Dropwort (*Œ. lachenalii*); 1 to 3 feet; root fibres cylindric; stem furrowed; leaves twice-pinnate, those from the root soon perishing, segments bluntly

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Marjoram.
Origanum vulgare.
— Labiatæ. —
$^2/_3$ *nat. size.*

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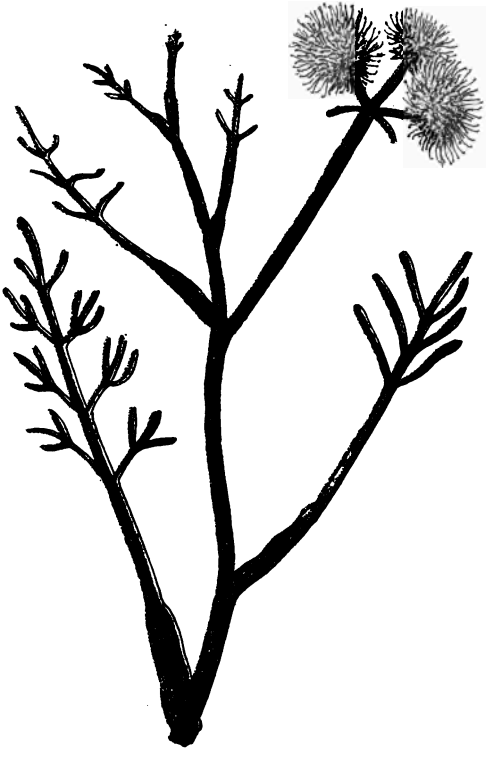

Water Dropwort.
Œnanthe fistulosa.
— Umbelliferæ. —
Nat. size.

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lobed; fruit broader than long, very small, rounded at top, with short, erect styles. Fresh and salt marshes. July to September.

II. Hemlock Dropwort (*Œ. crocata*); stem 2 to 5 feet, fistular, grooved; root-fibres spindle-shaped, 1 inch in diameter, parsnip-like; leaves broad, wedge-shaped, twice or thrice-pinnate, segments wedge-shaped; umbels many, on long rays. The fruits are narrow, almost cylindric, ¼ inch, with erect, rigid styles. Marshes and ditches. July. Many fatal accidents have resulted from mistaking the roots for parsnips, or the leaves for those of celery. Juice turns yellow on exposure to air.

The name is from two Greek words, *oinos*, wine, and *anthos*, a flower, in allusion to the vinous odour from the umbels.

Wild Pear (*Pyrus communis*).

From the huge soft-fleshed pears of the dessert-table to the small hard fruits of the Wild Pear that grows in our woods and thickets is a far cry; yet it is pretty certain that they are but different stages in the civilization, so to speak, of the species. Whether the pear is truly indigenous to this country is a matter upon which some authorities entertain doubt, regarding the wild trees as retrograded escapes from cultivation. However that may be, we know that the pear has been grown in this country for so long a period that even those who express these doubts refrain from calling it an alien, and speak of it instead as a denizen.

The Wild Pear is a graceful tree of forty or sixty—occasionally seventy—feet in height, of somewhat pyramidal shape, and presenting a beautiful appearance when it has put forth its fresh green leaves and clusters of pure white flowers in spring. A glance at these flowers is sufficient to indicate that it is one of the great Rose family. The open blossom is an inch or an inch and a half in diameter. The calyx-tube urn-shaped, with five lobes; petals five, and stamens numerous. There are five carpels and their stigmas mature before the anthers. The leaves are not ragged as are those of the White Beam (page 36), but of more regular outline—a long oval with sharp point—with blunt saw-teeth along the edge. When the leaves are new they are cottony beneath, and where they appear on the old

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spiny wood they are in bunches, but on the new shoots they occur singly and alternately. It should be noted that under cultivation the spiny character of the branches is lost. The flowers appear in April and May.

A figure and description of its congener, the Wild Apple, will be found on page 114.

Tufted Vetch (*Vicia cracca*). Plate 96.

Throughout the summer, from June to August or September, the bright blue flower-clusters of the Tufted Vetch may be seen in hedges and bushy places. It has a perennial creeping rootstock, angled stems two to four feet long, pinnate leaves with many narrow oblong leaflets. The leaves vary in size, and may be as much as four inches long, ending in a branched tendril. The flowers are numerous, varying from ten to thirty, all directed to one side of the raceme, which has a stalk several inches in length, though the footstalks of the individual flowers are very short. The flowers themselves are about half an inch long, bright blue, and rather hanging by their footstalks. They are succeeded by a many-seeded, beaked-pod, an inch or less in length.

There are nine other British species, and of most of these we have given descriptions in our First Series, page 44.

The name of the genus is the Latin for *tare*.

Deadly Nightshade (*Atropa belladonna*). Plate 97.

The Deadly Nightshade, or Dwale, is often found in the neighbourhood of ruins and on the sites of former gardens. In such places it is probably the descendant of plants that were grown there long ago for use in that branch of "domestic medicine" which concerned itself with the mixing of potions to quiet troublesome friends. When it occurs on open wastes above

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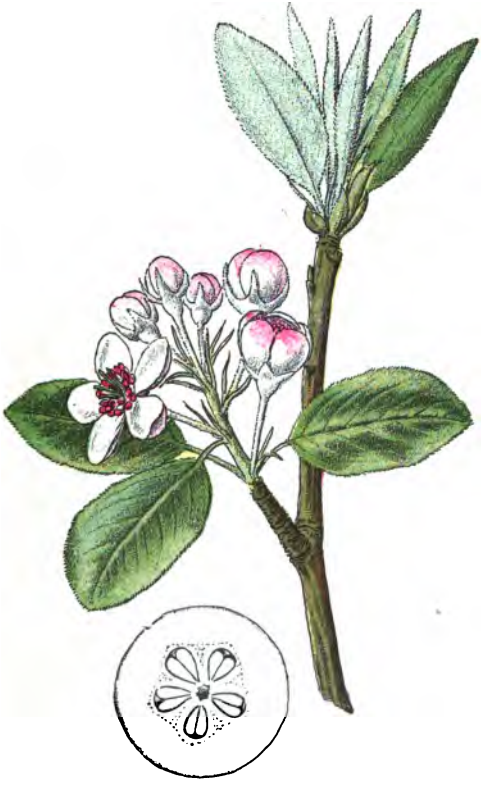

Wild Pear.
Pyrus communis.
— Rosaceæ. —
1/2 nat. size.

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Tufted Vetch.
Vicia cracca.
— LEGUMINOSÆ. —
$^{2}/_{3}$ *nat size.*

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chalk or limestone, it may be considered indigenous. It is a perennial plant, and forms a thick fleshy rootstock, from which come a number of stout annual stems, three or four feet in height, forming a bush. The leaves are stalked, egg-shaped, with entire edges, and dark green. The flowers droop on curved stalks that spring from the axils of leaves or shoots. They have a five-parted calyx, and a five-lobed, bell-shaped, dull purple corolla, about an inch across. The five stamens are inserted at the base of the bell, but the anthers come up to the mouth. The ovary is two-celled, and develops into a globular, black, shining berry as big as a cherry. Flowers June to August. The whole plant has an unpleasant smell, and is generally poisonous; but the juice of the berries is specially so. These have often proved too attractive to children, who have eaten them and died. Under the names of atropine and belladonna the juice is prescribed in modern medicine, chiefly for external use, and oculists find it valuable for its effects when dropped into the eye—the pupil dilating considerably and so facilitating examination. This trick was probably learned from the Italian ladies who have long used it to increase the apparent blackness of their eyes by enlarging the pupil, and from this practice comes the name *belladonna*. Dwale is an old English adjective, signifying delirious. The name *Atropa* is obviously derived from Atropos, whom the ancients represented standing with ready scissors to cut short the destinies of all, as her sister-Fates spun them out.

Whortleberry (*Vaccinium myrtillus*). Plate 98.

The Whortleberry, Blaeberry, or Bilberry, is a shrub with glossy stems and leaves, which grows as abundantly and as thickly as heather on some of our hills. Many of the happiest hours of our life have been spent in gathering "Hurts," as the berries are locally called, on Leith Hill in Surrey; and in

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pursuit of general natural history among the "wires." It forms a splendid cover for small creatures, growing to a height of about two feet, sometimes higher. Its stems are angular, smooth, like the leathery, oval, alternate leaves, and rise from a creeping rootstock. The young leaves have a beautiful rosy tint, which is soon exchanged for a dark green, but they get the rosiness back again when autumn touches them. The flowers are rosy and pitcher-shaped (*urceolate*), the short neck and mouth of the pitcher being formed by the four or five turned-out lobes of the corolla. This is an interesting flower to show to a person ignorant of the beautiful cross-fertilization arrangements of plants. Owing to the curving of the short flower-stalks, the flower hangs with its mouth downwards. The simple style occupies the centre of the flower, and its thickened end appears at the mouth of the pitcher. As it hangs the stigmatic portion is the sticky under-surface of this thick end. The stamens are ranged all round; their anther-cells in the shape of two tubes with spreading arms on their backs, so that entrance to the pitcher is barred by a series of radiating awns. The anther-tubes have open ends when the pollen is ripe, but the openings are pressed against the style. Now this flower produces much honey, so that bees desire to get their long tongues at the honey-glands within; but when a bee comes on this business her face knocks against the stigma, and either in that way or by touching against the awns with her tongue the anthers are moved and the loose pollen falls out in the bee's hairy face. Upon visiting another Whortleberry flower some of this pollen must be detached by the sticky stigma, and so a healthy crossing is effected! In due time the ovary develops into a succulent blue-black berry, with a fine glaucous bloom upon it. Flowers April to June.

There are three other British species:—

I. Bog Whortleberry (*V. uliginosum*). Found in mountain bogs and copses not south of Westmoreland and Durham. Differs from *V. myrtillus* in the possession

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Deadly Nightshade.
Atropa belladonna.
— SOLANACEÆ. —
$^{2}/_{3}$, *nat. size.*

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Whortleberry.
Vaccinium myrtillus.
— Ericaceæ. —
Nat. size.

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of round, woody stems, not erect; leaves *not* toothed, glaucous beneath; flowers in clusters of two or three; berry smaller. Flowers May and June.

II. Cowberry (*V. vitis-idæa*), with downy stems, evergreen leaves, dotted beneath, edges curled back; flowers in crowded, open racemes; anthers without awns. Berry red, and of acid flavour. Not found in South-East England. Flowers pink, June and July.

III. Cranberry (*V. oxycoccus*). Creeping amongst *Sphagnum* in peat-bogs. Only a few inches in height. Leaves evergreen, with edges curled back, glaucous beneath. Corolla split into four narrow segments and rolled back, the yellow anthers protruding. Flowers rosy, June to August; berries red.

Name uncertain; but probably corruption of *baccinium*, from Latin, *bacca*, a berry.

Sea Lavender (*Statice limonium*).

Where the Sea Lavender grows, on sand-dunes by the sea and on its muddy shores, it may often be seen covering great tracts with continuous sheets of purple bloom, reminding one of the purple heath on the moorlands and hills. We have three native species of the genus, all perennial herbs. All the leaves spring directly from the rootstock in each species, and are lance-shaped. The flowers are of regular shape, their parts in fives, with short footstalks, grouped in cymes, and these arranged in panicles.

Statice limonium, the common species, has a creeping and branching, woody rootstock, sending up many angular flower-stems (12 to 18 inches) which are considerably branched in the upper part, and nearly every branch bears flowers. Not only is the corolla coloured a bluish-purple, but the green calyx has a distinctly purple tinge; and there is a little tooth between the lobes. The leaves have long stalks, and are marked with one prominent rib from which the nerves run off in pinnate fashion; the tip often ends in a minute hard point. It continues to brighten muddy seashores with its flowers from July to November.

The Upright Sea Lavender (*S. auriculæfolia*) has a rootstock that is branched, but does not creep; it is short and upright. The leaves are on much shorter footstalks than those of

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limonium, and instead of the one rib they are marked near the base with three nerves. The flower-stems do not exceed a foot in length; they are branched from the middle. The corolla is blue-purple, but the lobes of the calyx are white. It flowers in July and August, and extends from the south coast to Wigton on the west coast, and only to Lincoln on the east.

The Matted Sea Lavender (*S. bellidifolia*) has the rootstock much branched and matted; the leaves spoon-shaped, on short stalks, ribbed *and* three-nerved, small and few. The stems are branched from a little above the rootstock, the branches being of a zigzag character, and few of them bearing flowers. Flowers small, pale lilac; July and August. Rare. Confined to the salt marshes of Norfolk, Suffolk, and Cambridge.

The name was applied by the Greeks to some unknown astringent herb, and is from *statizo*, to stop.

Tamarisk (*Tamarix gallica*).

Visitors to seaside places on the south, east, and west of England will constantly meet with a small tree or bush, ten or twelve feet high, with pliant feathery branches and minute evergreen leaves, which are triangular with keeled backs and eared bases, closely overlapping and appearing to be mere scales. This is the Tamarisk, a tree that is not a real native, but which has been grown in Southern England for so long that it has been considered to be wild. Its great recommendation is the power to withstand cutting salt winds, that destroy the foliage and branches of many perfectly hardy shrubs, and as it is readily propagated by cuttings it has become extensively used as a hedge for seaside gardens in the localities indicated. Its flowers are minute, white or pale rose, about one-eighth of an inch in diameter, but clustered in a blunt spike an inch and a half long. They consist of four or five lance-shaped sepals, a similar number of petals, and a tapering ovary, with three or

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Sea Lavender.
Statice limonium.
— Plumbagineæ. —
$^{2}/_{3}$ *nat. size.*

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Tamarisk.
Tamarix gallica.
— TAMARISCINEÆ. —
$^{2}/_{3}$ *nat. size.*

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four short, thick styles. It flowers from July on, as late as November in mild districts. The fruit is triangular. Several other species may be found in gardens and greenhouses, but this is the only one that has any semblance of wildness in this country.

The name is said to be derived from Tamaris, a Spanish river on whose shores the tree is plentiful.

Hornwort (*Ceratophyllum demersum*).

Hornwort is another of the unconsidered trifles of pond and ditch life. It has no bright flowers to be the delight of the waters as Frogbit has, but its very abundant foliage has a beauty of its own, and it is worth the while to hunt among it for the inconspicuous green flowers. There is this to encourage one in the investigation of Hornwort, that when you have learned all you can concerning it, you have not merely added another species to the list of your botanical acquaintances, but another entire genus, and an entire natural order; for Hornwort is the sole known representative of the Ceratophylleæ.

Hornwort has a much branched and jointed stem, round, slender, and brittle; densely clothed with leaves in whorls. These leaves are stalkless, twice forked with awl-shaped, dark-green segments, whose edges have a few distant teeth. It is from these leaves that the plant takes both popular and scientific names, for in the forking and toothing of the segments they bear some likeness to the antlers of a deer. Therefore is the plant called Hornwort in English, and Horn-leaf in Greek. The flowers are solitary, and must be sought in the axils of the leaves; but they will only be found on plants that have been growing in shallow water. There is no proper perianth, but its place is taken by a whorl of from eight to twelve bracts, forming an involucre. There is a division of the sexes, and the male flower consists of from twelve to twenty anthers,

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without filaments. The female flower is a one-celled oblong ovary, with awl-shaped style and one-sided stigma. The blossoms should be searched for between July and September.

The name is compounded from *keras*, a horn, and *phyllon*, a leaf.

Wood Sage or Germander (*Teucrium scorodonia*).

Should the novice encounter *Teucrium* before it commences to flower he might be pardoned for mistaking it for Sage. It is a plant of the dry wood and the stony hedgebank, whose reddish square stems and peculiar flowers mark it at once as a Labiate. It has a woody perennial rootstock that gives off runners under the surface of the ground, and erect stems in tufts, as much as two feet in height. The soft, wrinkled, and downy leaves are in pairs at a distance from each other; stalked. The flowers are in racemes five or six inches in length, with stalked bracts. The calyx is bell-shaped. The corolla yellowish-white with a pinkish tinge, looking as though the upper lip had been cut off obliquely. There are four purplish stamens, two long and two short, and a long pistil ending in two spreading lobes. Now when the flower first opens the two long stamens stand nearly erect, their upper ends curved slightly forward, so that when an insect alights upon the roomy lower lip and looks into the corolla for honey, its head will come in contact and remove the pollen. When these stamens have shed their pollen they curve backwards out of the way, and the pistil matures, opens her stigma-lobes and bends forward to occupy the precise position previously held by the anthers, so that when an insect comes from a younger *Teucrium*-flower with pollen on its head, the stigmas will detach a portion. This action should be well-studied when the flowers are out, that is from July to September. The other species are :—

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Hornwort.
Ceratophyllum demersum.
— CERATOPHYLLEÆ. —
Nat. size.

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Wood Sage.
Teucrium scorodonia.
— LABIATÆ. —
$^2/_1$ *nat. size.*

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I. Water Germander (*T. scordium*). A stinking perennial that affects wet meadows, chiefly in the Eastern counties, with stalkless leaves, coarsely toothed, woolly. Corolla ½ inch, rosy, with spotted lip. July and August. Very rare.

II. Annual Germander (*T. botrys*). Leaves stalked, pinnately lobed. Calyx large, inflated after flowering. Corolla two-thirds inch, rosy purple, lip spotted with white and red. August. Exceedingly local. Headley and Bookham in Surrey only.

III. Wall Germander (*T. chamædrys*) is a garden escape, found rarely on old walls. Perennial. Leaves gradually narrowing into the footstalk. Bracts stalkless, leaf-like. Corolla ¾ inch, rosy, lip spotted with white and red. Flowers July to September.

Name, the old Greek appellation for the plant, dedicated to Teucer of Trojan War celebrity.

Ploughman's Spikenard (*Inula conyza*).

Spikenard is a very ancient name for a plant with fragrant roots. That mentioned in the Scriptures is believed to be *Nardostachys jatamansi*. As this had to be imported from India it was expensive to buy, therefore ploughmen and other poor persons had to be content with the costless substitute, *Inula conyza*. Hence the folk-name for this common biennial, which grows in copses and on dry banks, its downy stem towering erectly for three, four, or five feet. Its large, oval-lance-shaped leaves are somewhat rough above, downy beneath ; the lower ones with footstalks, the upper ones almost stalkless. The numerous flower-heads are disposed in corymbs. They are yellow, but the ray-florets are very slender and thread-like, and though they possess a ligule it is so short as to be quite inconspicuous. The scales of the involucre are long and narrow, overlapping, the lower ones with their tips curved outward. It is another of those plants that are now known only to the botanists, because their lack of showiness leads to the flower being passed as that of "a mere weed." It flowers from July to September, but need not be sought north of York and Westmoreland.

Three other species of *Inula* are natives :—

I. Golden Samphire (*I. crithmoides*). A strong contrast between this and the last-mentioned. A perennial, maritime plant, growing on rocks and in salt marshes,

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with stout stem, but little branched, 1½ feet. The leaves are exceedingly narrow, fleshy, smooth, and yellow-green, without footstalks; not toothed, but sometimes divided into two lobes at the top. Flower-heads 1 inch across, yellow, one ending each branch; ligule short. July and August.

II. *Inula salicina.* Peculiar to the shores of Lough Derg, in Galway, where it flowers in July and August. It is a perennial, 1 to 1½ feet, with stiff, narrow leaves, toothed and slightly hairy. The yellow flower-heads are solitary, 1½ inch across; outer bracts of involucre leafy; ligules slender.

III. Elecampane (*I. helenium*). Occurs truly wild, but in most cases the specimens found are to be considered as the descendants of cultivated plants in herb gardens. Perennial, 3 to 5 feet; leaves large (radical as much as 1½ feet, saw-toothed, velvety beneath, oblong-lance-shaped, stalked); stem-leaves without stalks, heart-shaped. Heads of flowers 3 inches across, yellow; involucre leafy. Meadows and copses. July and August. The root is candied and used as a stomachic and expectorant medicine. The name is that used by the Romans, and is said to be a corruption of *Helenion*, because the plant was fabled to have sprung from the tears of fair Helen of Troy.

Hare's-foot Trefoil (*Trifolium arvense*).

There is a small and distinct group of flowers, of which the Hare's-foot may be taken as the type, with the flower-heads of cylindrical form. We have already dealt with the general characters of the genus *Trifolium*, and given brief descriptions of many of the British species (see Series I., pages 48–50). Hare's-foot Trefoil (*Trifolium arvense*) is a downy annual with many stems, almost erect, and the rather distant leaves of three slender leaflets, half to three-quarter-inch long. The leafstalk is provided with a pair of large stipules ending in long bristly points. The flowers are very small and numerous, gathered in long soft heads (half to one inch) on lengthening stalks, pinky-white in colour. The persistent calyx-teeth are much longer than the petals, and give a bristly appearance to the flower-heads, which are in evidence from July to September in dry fields. The plant is about a foot in height.

In addition to the species described in the First Series, we may mention as nearly approaching *T. arvense* the following :—

I. Boccone's Trefoil (*T. bocconi*). A very rare annual species, confined to the Lizard district in Cornwall. A downy plant with leaflets and stipules of an oval

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Ploughman's Spikenard.
Inula conyza.
— Compositæ. —
Nat. size.

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Hares-foot Trefoil.
Trifolium arvense.
— LEGUMINOSÆ. —
Nat. size.

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shape, the leaflets smooth and free from hairs on their upper surface. Heads not so long as in *arvense* (½ to ¾ inch), white. The calyx-teeth are not so long as the petals; the calyx remains around the seed pod. Flowers in July.

II. Crimson Clover (*T. incarnatum*). An introduced plant in general cultivation and naturalized. A downy annual with slender stems, leaves with short footstalks, the leaflets broadly oval or heart-shaped, 1 or 1½ inches. Heads at first oval, afterwards cylindrical, reddish purple, 1 to 2 inches. Calyx, with strongly developed ribs and hairy teeth, shorter than corolla. June and July. There is a variety (*molineri*), with pale yellow or rosy heads, occurring at the Lizard, where it is believed to be truly wild.

Knotted Figwort (*Scrophularia nodosa*).

It is a singular thing that, though most of the genera in the Natural Order, Scrophularineæ contain species with honeyed flowers, and most of them are carefully designed that insects may be the agents in cross-fertilization; none of the flowers give forth pleasant odours. If they are odorous at all, it is with anything but a fragrant scent. But they have their customers among insects, and provide that for which there is a demand. This Knotted Figwort (*Scrophularia nodosa*), for example, gives out a flavour that is nauseous to the human sense of smell, but to the flies and wasps, by which it is fertilized, it is, no doubt, suggestive of carrion.

The Knotted Figwort has a knotted, tuberous rootstock, a four-angled stem, with opposite pointed egg-shaped leaves, two to four inches long, stalked, their edges sharply toothed, and the teeth themselves edged with secondary teeth. The stem varies from one to three feet in height, and is unbranched. The flowers are arranged in cymes, and consist of a five-parted calyx, a corolla-tube swollen at the lower part, the mouth cut into five unequal lobes, of which the upper two are the largest, and the lowest and odd one spreads outwards. The colour of the corolla is either green or brownish. The plant may be found in flower from July to October, in shady places. The stigmas are ripe before the anthers, a condition entirely the opposite of Marjoram and others, but the object is the same

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in each case. Flies that have already visited an older flower bring with them pollen from its ripe anthers, and, by dropping a little on the stigmas of this younger blossom, secure cross-fertilization before its own pollen is discharged.

There are two other British species :—

I. Water Figwort (*S. aquatica*), found by the edges of ponds, streams, and ditches, with creeping rootstock, and a stem rising to 2, 3, or 4 feet, square, with wing-like expansions at the angles. Flowers green on the lower surface, brown on the upper side, but occasionally all white. July to September.

II. Balm-leaved Figwort (*S. scorodonia*). Rootstock creeping, stem not so evidently square as the others; 2 to 4 feet. Leaves heart-shaped, wrinkled and downy, with rounded teeth. Corolla dull purple. July and August, in Cornwall, South Devon, and Kerry.

Another species, not British, is occasionally found, the Yellow Figwort (*S. vernalis*), with small, yellow blossoms, flowering from April to June in waste places, but very local.

The name is from *scrofula*, for which it was formerly considered an excellent remedy.

Treacle Mustard (*Erysimum cheiranthoides*). Plate 106.

This is another of the neglected Crucifers that grows in the waste places of fields and roadsides. An annual plant, covered with short, forked hairs which impart a frosted appearance. The stem is round, straight, leafy, from one to two feet. Leaves narrow, lance-shaped, scarcely stalked, narrower at the base, the margins faintly toothed. The flowers small, about a quarter of an inch across; the petals clawed, yellow. The pods about an inch in length, narrow and square; the valves with a prominent keel, nearly erect. Flowers from June to August. It is not uncommon in the southern half of England, but in the northern half and in Ireland it is rare. This is the only British species.

The name of the genus is said to be from the Greek, *eruo*, to draw, in allusion to its former use as a blistering agent.

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Knotted Figwort.
Scrophularia nodosa.
— SCROPHULARINEÆ. —
½ nat. size.

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Treacle-Mustard.
Erysimum cheiranthoides.
— Cruciferæ. —
$^3/_4$ *nat. size.*

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Broad-leaved Helleborine (*Epipactis latifolia*).

Though bearing a similar popular name to that of the white Helleborine, described on page 27, this plant does not belong to the same genus, but they stand very close to each other. At one time the species of *Cephalanthera* were included in *Epipactis*, but have since been separated by Richard, the French botanist, on account of important differences in structure. *Epipactis* is much more plentiful and more widely distributed than *Cephalanthera*, occurring in woods and shady places throughout the kingdom, with the exception of the extreme north of Scotland. It has a creeping rootstock, and a solitary tall (three feet) leafy stem; the lower leaves egg-shaped, the upper ones narrower and smaller, all of them ribbed. The flowers form a one-sided raceme, with green bracts mostly larger than the flowers. They vary in colour from greenish with white, yellow, or purple markings, to a dull reddish-brown. In *Cephalanthera* and other genera of orchids, the ovary is twisted in order to bring the lip (which is properly the uppermost petal) to the lowest position on the flower. In *Epipactis* the ovary is quite straight, but the same result is attained by the twisting of the footstalk. Then it will be noted that there is no prolongation of the lip into a spurred nectary behind: the reason for this lies in the fact that the flower is not fertilized by bees or other long-tongued insects, but by wasps. To suit their particular shape of head and shortness of tongue, the lip is hollowed out behind to form a shallow bag, in which the nectar is secreted. The pollen-masses differ slightly from those of *Cephalanthera*, but are similarly placed to ensure their sticking to an insect that comes for honey. A wasp could enter this flower and take its fill of honey without disturbing the pollen-masses, but it cannot crawl out without striking against and detaching them, carrying them off to fertilize the next flower visited. So glutinous are the pollen

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grains that they cannot separate from one another and fall; and even if they could they would not fall upon the stigma; so that Darwin was justified in saying, "If wasps were to become extinct in any district, so would the *Epipactis latifolia*." The flowers may be looked for in July and August. There are several recognized varieties or sub-species, but they do not appear to be very stable. There is one other distinct species :—

The Marsh Helleborine (*E. palustris*). A much smaller species, with stem not exceeding 1½ feet, lance-shaped leaves and short bracts; fewer flowers, green striped with purple, the lip white streaked with red. Flowering in July, and found locally, in marshy places.

The name is the same as that used by the ancient Greeks for some species of Hellebore or Helleborine.

Common Fleabane (*Pulicaria dysenterica*).

One of the comforts arising from the possession of scientific names becomes evident when a person speaks of Fleabanes. Something like seven species of British plants are commonly designated Fleabane, whilst at least three others are Fleaworts. Which of these is intended can only be made plain if one is acquainted with the botanical names. One of these is the subject of accompanying plate, a plant which was (perhaps we should say is) considered to be obnoxious to fleas, though they only sniffed the smoke from its burning leaves and stems. *Pulicaria dysenterica* is a common plant in marshy places and by the sides of rivers. It springs from a creeping perennial rootstock, and has branching leafy stems about a foot in height. The leaves are wrinkled and downy, oblong heart-shaped with toothed edges, and the base partially embracing the woolly stem. The flower-heads are yellow, about an inch across, produced at the ends of the branches. The ray florets are developed into long slender straps (*ligules*), and contain no stamens, their material evidently having been used up in the

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Broad-leaved Helleborine.
Epipactis latifolia.
— ORCHIDACEÆ. —
¹/₄ nat. size.

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Fleabane.
Pulicaria dysenterica.
— COMPOSITÆ. —
$^3/_4$ *nat. size.*

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production of the ligules. The involucre is woolly, its scales bristly. It may be found in flower from July to September. Formerly it was used as a medicine in cases of dysentery, a fact that is embalmed in the specific name.

The only other British representative of the genus is the Small Fleabane (*P. vulgaris*), a rare plant, in spite of the suggestion of commonness in its specific name, which refers, however, not to its occurrence in these islands, but to its general distribution throughout Europe, North Africa, and Asia. It is a much smaller plant than *dysenterica*, and an annual. Its branching, downy stems are little more than ½ a foot in height, the leaves lance-shaped, slightly toothed. The yellow flower-heads do not exceed ½ an inch in diameter, with very short, erect ligules to the ray florets. The involucre is downy instead of woolly; and that, as well as the other parts of the plant, is slightly glandular. It flowers during August and September, and should be sought for in moist, sandy places; but it is by no means a conspicuous plant.

The name is a derivative from the Latin, *pulex*, a flea.

Purple Loosestrife (*Lythrum salicaria*).

Often when traversing a bit of marshy country, or tracking the course of a stream or river, we are delighted to see the banks of the water-ways lined for a considerable distance by tall-growing herbs, with numerous starry flowers of crimson hue. This is the Purple Loosestrife (*Lythrum salicaria*), a representative of the Natural Order Lythrarieæ; a perennial with creeping rootstock, and a stem that has in some individuals four angles, in others six, and in some cases as many wings. This stem attains a height of from three to five feet, is branched, and bears opposite, or whorled, entire, lance-shaped leaves and spiked racemes of flowers. The flowers are as much as an inch in diameter, and consist of a cylindrical calyx-tube with twelve teeth, of which the alternate ones are awl-shaped and longer than the others; four to six oblong petals, a two-celled ovary, and twelve stamens. Flowers July to September.

In our description of the genus *Primula* (First Series, page 2), we referred to the two forms of flower—the long-styled and the short-styled. In *Lythrum salicaria* we have not *dimorphism*,

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but *trimorphism;* there is a long-styled, a short-styled, and a mid-styled form, and each of these forms possesses two sets of stamens agreeing in length with the pistils of the other two forms. These differences allow of eighteen methods of fertilization, but only six of these result in perfect fertility. Not only are there differences in the length of the styles and stamens, but also in the size and colour of the pollen grains.

There is another native species :—

The Hyssop-leaved Loosestrife (*L. hyssopifolia*). A smooth annual, with very narrow, lance-shaped leaves, chiefly alternate, and stems from 6 to 18 inches long, prostrate or half-erect. It has small, pink flowers, all of one form, appearing from June to September, in swampy places, chiefly in the Eastern counties and in Cornwall.

The name is from the Greek, *lythron*, gore, from the colour of the flowers.

Canadian Fleabane (*Erigeron canadense*).

In waste places and on cultivated ground throughout the country, and perhaps more especially on the outskirts of London, this alien weed is common enough. It has a fondness for railway banks, along which every passing train helps to disperse its fluffy seeds. Yet like the introduction of many another species to a new country where it has rapidly spread, its presence is due here almost to an accident. The story goes that, in the middle of the seventeenth century, a solitary seed of *Erigeron canadense* came to Europe in a stuffed bird, and was sown. From the progeny of that single seed it has distributed itself throughout Europe with the aid, not of man, but of the wind, and must now be taken account of in the European floras.

Erigeron canadense is an annual, with stems from one to two feet high, branched towards the summit, and clothed with long narrow leaves which are sparingly toothed or have quite entire margins. The flower-heads are small, oval, and gathered into numerous axillary racemes. Each head has slender involucral bracts with dry margins; the ray florets short, white,

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Purple Loosestrife.
Lythrum salicaria.
— LYTHRARIEÆ. —
½ nat. size.

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Canadian Fleabane.
Erigeron canadense.
— Compositæ. —
$^1/_2$ *nat. size.*

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sometimes tinged with purple; the disk pale yellow. Fruit with white pappus. Its flowering time is August and September.

Two other species are found in Britain and are truly indigenous, though not so common as this alien. They are:—

I. Alpine Fleabane (*E. alpinum*), found only on the Breadalbane and Clova ranges. A bristly perennial, with spreading, lance-shaped radical leaves, and a few, narrow, oblong leaves on the flower-scapes, which do not exceed a height of 6 or 8 inches. Flower-heads from one to three only, about ¾ inch across; involucre covered with long, weak hairs; ray florets purple, ligule slender, disk florets yellow. Pappus reddish. Flowers July and August.

II. Blue Fleabane (*E. acre*). A bristly annual or biennial, with leafy stems, branched above, from 1 to 2 feet. Radical leaves, broad lance-shaped; stem leaves narrow, oblong, half-clasping the stem; all with entire margins. Heads ½ to ¾ inch across, on slender stalks, panicled; involucral bracts very narrow, bristly. Ray florets narrow, pale purple, disk florets pale yellow, pappus reddish. Flowers July and August, on dry banks.

The name of the genus was formerly given to the groundsel; it is formed of the Greek words *eri*, early, and *geron*, an old man, from the aspect of premature age given to the flowers by the hoary pappus.

Common Hemp-nettle (*Galeopsis tetrahit*).

The Hemp-nettle is one of a group of Labiate plants that too frequently get confused in the public mind with Dead-nettles (*Lamium*), on account of the superficial resemblance of their foliage, and the similar squareness of stems and opposite branches. The Woundwort, the Hemp-nettle, and Dead-nettle come particularly close together, and are separated into different genera, chiefly on account of small differences in the structure of the calyx and the forms of the fruit. In *Galeopsis* the calyx is nearly bell-shaped, with five equal spiny teeth. The corolla-tube is straight, with a divided throat; the upper lip egg-shaped and arched, the lower three-lobed, with erect teeth where the lobes unite. To pass from the genus to the commonest species, *G. tetrahit* is distinguished by its bristly stem, which is much swollen beneath the *nodes* whence the leaves and branches are given off. Its stature is about three

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feet. The leaves large, very coarsely toothed, on long stalks. The flowers are in dense whorls around the upper part of the stem, with leafy bracts beneath them. The teeth of the calyx are very long, straight and awl-shaped, equalling or exceeding the length of the calyx-tube. The corolla is in the type purplish or white, but there is a sub-species in which the colour is yellow and purple. It flowers from July to September, and may be looked for round about cultivated ground generally. There are two other species :—

I. Red Hemp-nettle (*G. ladanum*), with downy stems, the nodes *not* thickened. The calyx teeth are not longer than the tube. The corolla is rose-coloured, hairy, and with mottlings on the lower lip. July to October, on chalky and gravelly soils. Less common than *tetrahit*.

II. Downy Hemp-nettle (*G. dubia*). The last-mentioned is downy, but this is more so, the soft hairs of *ladanum* becoming glandular in *dubia*. The leaves also are broader, more deeply toothed, the calyx-teeth are not so spiny, and the large corollas are pale yellow, rarely purple or white. It is of local occurrence in sandy corn-fields, and very rare. July and August.

The name is from the Greek words, *galée*, a weasel, or cat, and *opsis*, appearance, from the resemblance between the upper lip of the corolla, seen sideways, and a weasel's head.

Felwort (*Gentiana amarella*).

The Gentians are all beautiful flowers, and some of the Alpine species arouse the enthusiasm of climbers in the European Alps. There are five species inhabiting these islands, and we have selected the most widely distributed as a type. It is an annual herb that must be sought in dry pastures and on chalk downs, where it flowers from July to September. Its stature varies from four inches to a foot. The radical leaves are spoon-shaped ; those of the stems lance-shaped and opposite. The stem branches above and bears the numerous pale purple flowers in panicles. Individually the flowers have the sepals united into a five-lobed calyx, the petals similarly joined in a five-lobed corolla ; there are five stamens and a two-lobed stigma. Within the throat of the corolla there is a fringe of hairs. The

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Hemp Nettle.
Galeopsis tetrahit.
— LABIATÆ. —
$^1/_2$ *nat. size.*

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Felwort.
Gentiana germanica.
— GENTIANEÆ. —
Nat. size.

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species consist of two forms or sub-species, which were formerly ranked as entirely distinct. *Amarella* proper has the lobes of the calyx nearly equal, and half as long or quite as long as the corolla-tube; and there is an early-flowering variety of this (var. *præcox*), with the flower parts in fours and the calyx-lobes unequal. The sub-species *germanica*, which is figured on the opposite plate, is a larger and stouter form than the other, with larger flowers; two of the calyx-lobes are broader and sharper than the others, and none are so long as the corolla-tube.

The other British species are :—

I. Field Gentian (*G. campestre*). Annual, similar to *amarella*, but flower parts in fours, calyx more deeply divided, the lobes very unequal, the two broader overlapping the much narrower, inner ones. Corolla 1 inch, pale lilac, occasionally white. Moist pastures; more frequent in the north. July to October.

II. Marsh Gentian (*G. pneumonanthe*). Perennial, 1 to 2 feet, stems slender, branched but slightly. Calyx with two bracts; lobes five, equal. Corolla 1½ inch, bell-shaped, bright blue, with fine green lines on outside, no hairs in throat. Moist heaths; local and rare. August and September.

III. Spring Gentian (*G. verna*). Perennial, 2 inches, root-leaves forming rosettes, stems in tufts, each terminated by a solitary, bright-blue, salver-shaped flower, 1 inch across. May and June. Rare and local, on wet limestone rocks in N. England and N.W. Ireland.

IV. Small Alpine Gentian (*G. nivalis*). Annual, 2 to 8 inches, stem slender, flowers few or solitary, funnel-shaped, blue. Very rare. Recorded only from the mountains of Bredalbane and Clova, above 2400 feet. August and September.

Water Milfoil (*Myriophyllum spicatum*).

There is a small Natural Order of inconspicuously flowered plants, called Halorageæ, containing the three genera *Hippuris* (Mare's-tail), *Callitriche* (Water Starwort) and *Myriophyllum*, all aquatics. They must be sought in ponds, lakes, ditches, and sluggish streams.

The most striking character of Water Milfoil (*M. spicatum*) is the feather-like leaves. These are very finely divided in a pectinate fashion, and mostly in whorls of four. The flowers are minute, arranged in whorls round a leafless stem, with *smaller* pectinate bracts in whorls of four beneath them. The

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sexes are in separate flowers, but on the same spike, the upper ones staminate, the lower pistillate, and the intermediate whorls often containing both stamens and pistils. The male flowers consist of a four-lobed calyx, two or four concave petals, and two, four, or eight stamens. Female flowers with minute calyx and corolla, or none; a four or two-celled ovary with four feathery styles; fruit a deeply lobed drupe. Flowers green. June to August.

There are two other British species :—

I. Whorled Water Milfoil (*M. verticillatum*). Flowers white, bracts *longer* than flowers, pectinate or pinnatifid, in whorls of five. July and August.

II. Alternate-flowered Water Milfoil (*M. alterniflorum*). Similar to *spicatum*, but the bracts of the female flowers, in whorls of three or four, pectinated, and longer than the flowers; male opposite or alternate, with entire or toothed edges, and shorter than the flowers. More slender than *spicatum* with fewer flowers. June to August.

The genus is named from the Greek *murios*, many, and *phullon*, leaves, from the numerous divisions of the leaves.

Crab Apple (*Pyrus malus*).

The Wild, or Crab Apple, as a rule, is a low tree of twenty or thirty feet stature, but sometimes is found as high as forty or fifty feet. It is not a tree of special elegance, its outline being irregular, and spreading with some rough approach to a roundness of head. Like those of the Wild Pear, the branches of the Crab frequently develop thorns to indicate relationship with the Wild Plums. Its leaves are of the rounded oblong shape, an inch or two long, toothed, on long stalks. The flowers are borne in few-flowered umbels, and the rosy undersides of the petals give the tree a beauty that no other species of the genus *Pyrus* possesses. These flowers are an inch or more across, of the usual Rose type, the five separate carpels being ultimately buried in the fleshy upgrowth of the flower-stalk, and become the "core" of the golden yellow, or fiery red, globular fruit, an inch or so in diameter, with which the rambling schoolboy fills his pockets. The flowers usually appear in

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Water Milfoil.
Myriophyllum spicatum.
— Halorageæ. —
Nat. size.

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Wild Apple. Crab.
Pyrus malus.
— Rosaceæ. —
⅓ nat. size.

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May, and their stigmas mature before the anthers, so that as their abundant output of honey induces many insects to visit them, there is sufficient provision made for cross-fertilization.

There are really two varieties of the Crab, the first (*P. malus* proper) with the young leaves and the calyx-tube smooth, the footstalks smooth or nearly so, and the fruit hanging down; and the var. *mitis*, with all these parts downy and the fruit erect on the footstalks.

It is believed that the cultivated Apple was introduced to Britain by the Romans, and it is not meant to suggest by this statement that these invaders were the original pomiculturists. The Apple was known as a food to prehistoric man, as we have evidence in the explorations of the lake-dwellings, and it was probably some advance upon the austerity of the wild fruit that tempted him to consume it.

Wild Carrot (*Daucus carota*).

The Wild Carrot is an Umbellifer, and is believed to be the plant from which the various kinds of Table Carrots have been evolved under cultivation. If the rambler will pull up a Wild Carrot by the roots he will see that the nucleus is there, though the difference between its dry stick of a root and the juicy, thick flesh of the Dutch Horn is enormous. From this root arises the tough, branched stem, which is ridged and grooved, and densely clothed with white hairs. The majority of the Umbellifers have the stems hollow—except at the joints—but in this species they are solid. The leaf-stalks are flattened out broadly and clasp the stem. The leaves are very much divided —technically they are *decompound*—the divisions being *pinnate* like ferns, and the undersides are hairy like the stems. The small white flowers are, of course, arranged in umbels, and some forty or fifty umbels are gathered together in a saucer-shaped head. Each petal is notched on its outer edge, and

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a portion turned over towards the ovary. The little bracts (*bracteoles*) of the small umbels are simple lance-shaped, except the outer row, which have three of them branched. The bracts of the compound umbel are much broader, and deeply cut into about seven narrow segments. The fruits—an important element in the identification of all Umbellifers—are oblong and convex, each carpel with seven ridges, four of which are armed with long, curved, distinct spines, and pierced with oil tubes (*vittæ*).

The flowers are conspicuous from May to August in hedges, the waste corners of fields, and on the roadside.

There is a sub-species, the Seaside Carrot (*D. gummifer*), with broader, thicker, and closer leaves, the flower-heads hemispherical, and the spines of the fruit joined at their bases, instead of being distinct. It was formerly considered a different species, but is now included under *D. carota*.

Daucus is the old Greek for the plant, as used by Dioscorides.

Marsh Cudweed (*Gnaphalium uliginosum*).

The Cudweeds are a neglected little genus of so-called everlasting flowers. There are but four British species, of which only two can be said to be fairly common. They are lowly herbs of an exceedingly woolly character, stem and leaves being alike covered with white hairs, whilst the scales of the involucre are of the peculiar character to which the term *scarious* is applied. They are stiff, dry, semi-transparent, retaining both form and colour for a very long period. They lack the beauty of *the* everlastings—Acroclinium, Helichrysum, and other exotic genera—for their flowers are small and unpretentious, the Jersey Cudweed (*G. luteo-album*) being the only one having any claim to be considered beautiful.

I. Marsh Cudweed (*G. uliginosum*) is an annual, with a number of short branches (4 to 6 inches) rising from a prostrate stem. The leaves are narrow, simply stalked, cottony; those just below the flower-heads much narrower. The flowers are yellowish-brown, terminal on the branches. It is common in damp places on sandy heaths, and blooms from July to September.

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Wild Carrot.
Daucus carota.
— Umbelliferæ. —
1/2 nat. size.

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Marsh Cudweed.
Gnaphalium uliginosum.
— Compositæ. —
Nat. size.

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II. Jersey Cudweed (*C. luteo-album*) is also an annual, with many leafy stems, but of somewhat greater stature, varying from 6 to 12 inches. The leaves are long and narrow, with waved margin, and slightly embrace the stem (half *amplexicaul*). The flower-heads are pale yellow, in dense corymbs, conspicuous; and the scales of the involucre are glassy. It flowers in July and August, and occurs in light soils in Norfolk, Suffolk, and Sussex, but more frequently in the Channel Islands, whence its name.

III. Wood Cudweed (*G. sylvaticum*). Perennial, with a woody rootstock. Stem unbranched, nearly erect, 1 foot, downy. Leaves not clasping stem. Flower-heads forming a raceme, upper scales yellow or brown; lower cottony. Woods, thickets, and pastures. July to September.

IV. Dwarf Cudweed (*G. supinum*). Perennial, stem almost prostrate; flowering stems erect, forming low, woolly tufts. Leaves narrow, lance-shaped. Flower-heads small, brown, one, two, or three to each stem. Flowers July and August. Summit of the Highland mountains only, but there abundant.

The name of the genus is from the Greek, *gnaphalon*, soft down.

Hog-weed (*Heracleum sphondylium*).

One of the most conspicuous constituents of the moist hedge-row and waste is the coarse-growing Hog-weed, or Cow Parsnip, with its great umbels of white flowers, and its broad, dust-covered leaves. It has a thick, rough, grooved and hairy stem, which commonly attains a height of four feet, but frequently reaches as high as six feet; it is hollow, and its upper portion is branched. Like Carrot, this is one of the Umbelliferæ, as the reader by this time will be able to see at a glance; but its large leaves are not nearly so much cut up as is general in the order. These, it is true, are pinnate, but the leaflets, instead of being again pinnate, are simply lobed. The compound umbels form a large head of bloom, varying in tint from white to pink, the outer ring of flowers very irregular in form.

Hog-weed is very convenient for observing the characteristic fruiting of Umbellifers. The two cells of the ovary have developed into a couple of slightly convex, shield-shaped fruits, suspended from the upper part of its inner surface by attachment to the tip of a bristle, which is dignified with the sounding name of *carpophore*, or carpel-bearer. Within each of these fruits is a single flat seed, and the outer shell is ridged and grooved in

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a manner that is peculiar to each species. In Hog-weed each fruit has five ridges, one near each border, parallel with the outline, one down the centre, and one on each side of the last. Between these ridges are four slightly curved, club-shaped brown marks, due to the presence, beneath the skin, of oil-tubes (*vittæ*) containing the essential oil to which these fruits owe their aromatic qualities. On the inner face of the fruit there are two similar *vittæ*.

This is the only British species, and may be found in flower from June to September. The name of the genus is derived from Hercules, and may refer to the strength and robustness of the plant, or to some supposed strength-giving virtues possessed by it.

Mugwort (*Artemisia vulgaris*).

How much some plant-names convey; how little do others mean! There are not a few of the folk-names of our native flowers which have lost all meaning to the present generation. What can the ordinary reader make of Baldmoney, Ale-hoof, Mat-felon, Mill-mountain, and many others? Mugwort, however, does convey a meaning still, though the use of the plant to give a bitter flavour to our drink may be quite obsolete. The allied Wormwood (*A. absinthium*) is still used for a similar purpose, as indeed is suggested in the name of *absinthe* given to the liqueur that has played such havoc on the Continent. We have four native species of Wormwood, as the *Artemisias* are generally termed, of which Mugwort (*A. vulgaris*) is the most widely distributed. It is a perennial aromatic herb, the red, rough stem from two to four feet high, shrubby at the base and branched above. The leaves are alternate, much cut into sharp-pointed segments, and silvery white beneath with silky down. As in the case of the other species, the leaves are arranged alternately on the stems; they are stalked and the

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Hogweed. Cow Parsnip.
Heracleum sphondylium.
— Umbelliferæ. —
1/3 nat. size.

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Mugwort.
Artemisia vulgaris.
— Compositæ. —
½ nat. size.

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margins of the segments are turned back. The flower-heads are small, and are gathered into many short woolly spikes. They contain but a few tubular reddish-yellow flowers, which are wind-fertilized. The outer flowers contain no stamens, and the corolla has but three teeth. The inner ones have five teeth and contain only stamens, or stamens and pistil. It is a plant of waste-places, and flowers from June to September.

The other species are :—

I. Field Wormwood (*A. campestris*), 1 foot high, with nearly smooth leaves, silky when young; not aromatic. The few narrow segments have their edges turned back. Heads small, drooping, numerous, in long racemes. Florets yellow, only the outer series producing seed. Sandy heaths. Rare. Norfolk and Suffolk only. August and September.

II. Common Wormwood (*A. absinthium*). Stems 1 to 3 feet, with leaves silky on both sides, dotted; segments many, their edges flat. Flower-heads half-round, silky, drooping, in leafy racemes. Florets dingy yellow; outer only producing seed. Local. Wastes. August and September. Strongly aromatic.

III. Sea Wormwood (*A. maritima*), 1 to 1½ foot; leaves downy, segments flat. Heads narrow, in short spikes; florets reddish, all fertile. Seashores and salt marshes. Rare in Scotland. August and September.

The genus is named after *Artemis*, the Diana of the Greeks.

Reed (*Phragmites communis*).

The Reed is our giant grass, often towering to a height of ten feet, and forming extensive "reed-beds" in fens, and on the margins of lakes and rivers. Many a wild creature finds a home in its sheltering jungle, and one bird—the reed-warbler—not only chooses it as a suitable spot in which to build, but uses the leaves and stems of the Reed to be woven into a light, but safe and bulky basket-nest. There is an extensively creeping rootstock, which is jointed like a length of bamboo, and from which the thick round stems shoot straight up. The leaves are from half an inch to an inch wide, flat, stiff and sharp-pointed, their edges bristly, and the undersides glaucous. The panicle is very large and soft (from a foot to a foot and a half in length), somewhat oval in outline, dense though soft and

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nodding, of a purple hue. The spikelets are half-round, glossy, containing three flowers or five, and two short, unequal, empty glumes. The flowering glumes—except the lowest in each spikelet—are surrounded by long silky hairs as long as the glumes. The flowering time is July and August; and the plant will be found generally distributed throughout the three kingdoms. This is the only species. The name is said to be derived from the Greek word, *phragma*, a fence or enclosure, on the ground that the stems of Reed may be used for such purpose.

Hard Fern (*Lomaria spicant*).

We have already given a brief indication of the broad differences separating the flowering plants from the Ferns (see First Series, page 123), and at the same time we described and figured several species. Ferns are so much in favour with the average flower-lover, that we have been urged to give a more liberal representation of the group in the present volume. We have, therefore, selected nine typical species for illustration and description, and by their aid hope to give clues to several unrepresented species.

The Hard Fern, Snake Fern, Herring-bone Fern (*Lomaria spicant*) has a stout creeping rootstock, branched and matted in those places where great quantities of it grow together; as, for instance, in the fir-woods on the Leith Hill range in Surrey. It is, perhaps, prettiest when growing on a soft mossy bank beside a woodland stream, the outer, shorter, barren fronds with a slight lateral curve, lying flat on the moss with their points to the stream, whilst above them stand erect the exceedingly long-drawn-out fertile fronds with their distant and attenuated pinnæ. Turning this long fertile frond over, we find that each pinna bears two long lines of spore-capsules (*sori*) parallel with its margins, protected by an involucre of dry

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Reed.
Phragmites communis.
— Gramineæ. —
1/4 nat. size.

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Hard Fern.
Lomaria spicant.
— Filices. —
$^1/_2$ *nat. size.*

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membrane, opening away from the margin. The fruit appears on the new fronds in July and August.

This is the only British species. The name is from the Greek, *loma*, a fringe or border, in allusion to the position of the sori.

Black Maidenhair Spleenwort (*Asplenium adiantum nigrum*).

This is a common evergreen species, occurring in some places in extreme abundance. In parts of Cornwall the stone-flake walls are often completely veiled by the clean, shining fronds. In form and size it varies greatly, according to the soil and situation. On dry, stony banks it is a stunted and bronzed plant of two or three inches only, but on the bank of a deeply cut lane where it has access to abundant rich, black, leaf-mould it may be twenty inches or more. The frond is narrow wedge-shaped, rather leathery, polished, dark-green, supported on a very long stipes, equally polished, hard and wiry, and soon turning to a deep purple-brown—the *black* Maiden-hair of the popular name, in allusion to its resemblance to the polished stipes of *the* Maidenhair Fern. The frond is bipinnate, often tripinnate; the pinnæ alternate, the lowest two much *larger* than the others, and their lowest pinnules again pinnate. The rachis is slightly winged and compressed. All the pinnules are toothed on their upper margin only, and some are lobed. The character of the veins in this and other species should be noted carefully and compared. On looking at the underside of the pinnule, it will be seen there is a central vein (or inconspicuous midrib), from which simple or branched veins run off to the margins; on these veins the sori are produced. These may be detected whilst yet the young frond is unrolling, as thickened whitish lines, and as the frond matures these lines thicken and swell, then the involucre splits along one edge and discloses the reddish-brown spore-capsules. The sori are at

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first distinct, but by the development of the sporangia and the consequent thickening of the cluster several merge together, until the centre of the pinnule is a rusty mass. The capsules will be found ripe from June to October.

The Lanceolate Spleenwort (*Asplenium lanceolatum*) is in some respects very similar to the Black Spleenwort; but it may be at once distinguished by the fact that the lowest pair of pinnæ are smaller than those just above them, so that the shape of the frond, instead of being wedge-shaped as in the last species, is lance-shaped. Then, again, the pinnæ, instead of taking a somewhat upward direction, as in *nigrum*, are almost at right angles with the rachis, and are usually opposite, sometimes alternate. The frond is bipinnate, and of thinner texture than that of *nigrum*. Its distribution is principally along the south coast from Kent to Cornwall; it again occurs in Gloucestershire and Wales, and in County Cork. In the Channel Islands it grows luxuriantly.

Lady Fern (*Asplenium filix-fœmina*).

For size and delicacy combined we have no native fern that can compare with the Lady Fern. It is exceedingly variable, and some depauperated forms growing in an exposed situation are too stiff in habit; but when growing in a wooded valley with its roots in a wet, peaty soil, and its crown elevated to a height of six or eight inches above the ground, it is a sight worth seeing. In such a position its fronds will be four or five feet in length, and very numerous; twenty would be a small number, and we have counted seventy and eighty on old individuals. These fronds are not arranged in stiff shuttlecock-fashion like those of the Male Fern, but in a freer, more graceful manner, the inner ones erect, the outer, curved back or to one side, and in varying degrees of spreading or ascending. In the typical form of the Lady Fern, the frond is oblong lance-shaped, twice pinnate, with a brittle, juicy stipes, channelled throughout its upper surface, and coloured purple-brown or pale yellow. The lance-shaped pinnæ are themselves pinnate, and the pinnules toothed. In other forms even the pinnules are again pinnate. The substance of the frond is soft and thin,

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Black Spleenwort.
Asplenium adiantum-nigrum.
— Filices. —
$^1/_2$ *nat. size.*

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Lady Fern.
Asplenium filix-fœmina.
— Filices. —
½ nat. size.

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and the deprivation of moisture at the roots will, in a very brief space, convert the whole into a heap of flaccid rags. The sori are oblong, slightly curved, or so much curved as to be horseshoe-shaped, and covered by an involucre shaped to match, convex, and with the free margin fringed or jagged. The fruits are ripe in July and August, and the fronds are completely withered up by frost. Mr. E. J. Lowe, F.R.S., records nearly three hundred varieties, natural and cultivated, of this species.

The Lady Fern may be successfully sought anywhere that percolating moisture, shade, and warmth unite to offer suitable accommodation for so delicate yet vigorous a plant.

Scale Fern (*Asplenium ceterach*).

The rambler who comes upon an old wall or rocky place in whose crevices the Scale Fern is rooted, will experience no difficulty in identifying it by means of the small, deep green, leathery fronds so densely clothed upon the back with rusty scales. In this respect alone it differs widely from every other native species. These scales are so thickly and uniformly distributed that it is sometimes difficult to see the sori beneath them, and to make out the relationship of the species. Like the Lady Fern, it constitutes a sub-genus of Spleenworts (*Asplenium*), and is separated from the others by this chaffy character of the frond and the more important fact that the involucre is almost obsolete, being reduced to a very narrow membrane or represented by a ridge on the swollen nerve from which the sorus arises. The frond is simply pinnatifid, from three to six inches in length, the rounded lobes being alternate, and their edges quite free from teeth. They spring in tufts from a short, stout rootstock, and are supported upon black wiry stipes, whose true character, however, is disguised by a clothing of chaffy scales.

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Within a short distance from our home is a low garden wall, and every joint between the stones is occupied by *ceterach*, and its allies the Wall Rue (*A. ruta-muraria*) and the Maidenhair Spleenwort (*A. trichomanes*). These three mural species, so different in character, harmonize well in such association, and turn a not very lovely erection into a thing of beauty. The rambler should be warned that he is liable to be imposed upon by this fern. After a continuance of dry weather he may come upon a station for *ceterach* with every plant apparently dead; the lobes of the fronds are curled inwards, and it bears a general appearance of being scorched up by the heat. And yet should a good shower fall that evening, and the spot be again visited on the morrow, every frond will have expanded again, and be looking fresh and vigorous. The name *ceterach* is said to be a corruption of *chetherak*, by which it was known to Arabian and Persian medical writers.

Prickly Shield Fern (*Aspidium aculeatum*).

The Prickly Shield Fern is too frequently confused in the minds of the non-botanical with the Male Fern, but a very superficial examination will suffice to show considerable difference. The ultimate divisions of the pinnæ have more angular spiny teeth, and the involucre is circular, attached by the middle of the underside instead of being kidney-shaped and attached laterally. The frond is dark green, harsh in character, narrow lance-shaped in form, and four or five feet in length. It springs from a stout and tufted rootstock, and is supported by a short, stout stipes, which is densely clothed with reddish scales. The pinnæ are also lance-shaped, and are broken up into oblique wing-shaped pinnules attached by their bases, which are narrowed to a fine point, running back a little down the side of the midrib (of the pinna), and prickly-toothed on their upper edges. The pinnæ are short in comparison with

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Scale Fern.
Asplenium ceterach.
— Filices. —
½ nat. size.

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Prickly Shield Fern.
Aspidium aculeatum.
— Filices. —
¼ nat. size.

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the length of the frond, and give it a far less robust appearance than is presented by the broader Male Fern. The upper pinnule of each pinna that is nearest the main rachis is always much larger than the others. Turning the frond over, we see the circular sori arranged in two rows, one on each side of the mid-vein of the pinnule. Each sorus is covered by the round involucre. The capsules are ripe in July and August.

There are many varieties and two sub-species: *A. lobatum* and *A. angulare*. *Aspidium angulare* is generally regarded by fern-growers as a distinct species under the familiar name of the Soft-prickly Shield Fern. It is of thinner texture, paler colour, less rigid, the pinnæ more crowded, the pinnules attached by a short footstalk, teeth large with long points, the outer edge of the pinnule distinctly angular; and all the branches of the rachis clothed with pale brown scales.

Both forms retain their fronds during ordinary winters in the sheltered habitats they usually select. The only other native species of the genus is the Holly Fern (*A. lonchitis*), confined to the northern half of Britain, and to Ireland. The name is from the Greek *aspis*, a shield, the involucre resembling the round shields in use by the ancients.

Prickly-toothed Buckler Fern (*Nephrodium spinulosum*).

In the deepest and dampest recesses of the woods, and in the thick beechen hedgerows of hollow lanes among the sand ranges, the rambler may expect to find the Prickly-toothed Buckler growing to perfection. A hollow lane at the foot of a wooded hillside, with a northern aspect, where there is percolating moisture and an abundance of leaf-mould, will afford hundreds or thousands of specimens. The thick, branching rootstock creeps along in a half-erect manner, forming a number of connected crowns. The fronds grow erectly from one to three feet high, of which about one-half is stipes, sparsely

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clothed with semi-transparent scales. They are bipinnate; the three or four lowest pairs of pinnæ being nearly equal in length, the lower pinnules on each pinna being larger than the upper series. But for a slight undulation in the midrib the pinnæ might be described as wedge-shaped. The pinnules are all but pinnate, their lobes being cut almost to the main-nervure; the lobe teeth are drawn out to five soft spiny points. The involucre is smooth, notched on one side so that it is kidney-shaped; and the round sori are ranged in linear order on each side of the main nerve of the pinnule, on the upper half of the frond only. The spore-capsules are ripe in August and September.

The Broad Buckler Fern (*N. dilatatum*) is a sub-species, with broader, larger fronds, nearly triangular, twice or thrice-pinnate, darker, pinnæ closer, glandular beneath, involucre soon thrown off. The fronds have a graceful arching habit, which is especially fine in luxuriant specimens grown in a wood where they have had room to expand without contact with any other plant. Ordinarily, it grows to a height of two or three feet, but under exceptionally favourable conditions of deep rich leaf-mould and a humid atmosphere, it will produce a circlet of arching fronds five feet long.

There are six other species in the genus, including the Male Fern (*N. filix-mas*), for which see First Series, page 124. The name is from the Greek, *nephros*, the kidneys, in allusion to the kidney-shaped involucre.

Common Polypody (*Polypodium vulgare*).

The Common Polypody is really common, and away from towns it is almost ubiquitous. It is a fern with a fine capacity for adapting itself to circumstances. It will eke out a miserable existence on a wall where it has little material of which to construct its leathery evergreen fronds, and where it gets too little moisture and too much dry heat, so that at the best it can only

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Broad Buckler Fern.
Nephrodium spinulosum.
— Filices. —
1/4 nat. size.

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Polypody Fern.
Polypodium vulgare.
— Filices. —
$^1/_3$ *nat. size.*

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put out fronds an inch or two long. Its proper habitat appears to be the top of a hedge-bank where good leaf-mould collects, and where it is alike sheltered from strong winds and scorching sunshine. Then it not merely vegetates; it grows, it luxuriates and produces fronds two feet in length and broad in proportion; its creeping, scale-clad rhizomes show its prosperous condition also, for they are as thick as one's little finger and branch so frequently that they realize the meaning of the name polypod —many feet. Frequently, it fixes upon an equally advantageous position in the top of a pollard or at the forking of a Beech; there much leaf-mould collects and the Polypody prevents the dispersal of it by running its rootlets all through it, and its rhizomes over its surface. Again, it climbs up the straight trunks of trees in damp woods; in the Oak-woods that clothe the steep banks of the Fal, in Cornwall, it commonly grows in this position.

The frond does not need a description so wearily detailed as some of its predecessors. Its leafy portion is lance-shaped, cut in from each side to very near the rachis, but not sufficiently so to call it pinnate; it is pinnatifid, or cut in a pinnate manner. The lobes are rounded or blunt-pointed at the free end. The distinctive feature of the genus is the globose form of the sori and the fact that they are not covered by any involucre. *Polypodium vulgare* has an additional character which serves to separate it from the three other species, quite apart from its distinctive form, and that is the articulation of its stipes to the rootstock. When the fronds have entirely served their purpose they are thrown off by a voluntary act on the part of the plant, as sharply as are the leaves of the Horse Chestnut or any other deciduous tree. None other of our ferns act in this manner. The fruit of the Polypody will be found from June to September. There is a remarkable variety, *cambricum*, which has broader lobes, and these are again pinnatifid.

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Royal Fern (*Osmunda regalis*).

The Royal Fern, as the noblest of our native species, is one that we can ill-afford to lose, but in recent years there has evidently been a dead-set made upon it by the dealers, and in some localities where formerly it was plentiful it has been all but extirpated. There are such places within thirty miles of London that have been devastated by the dealer recently; yet there the patient botanist, who wishes to see and not touch, can have the delight of beholding *Osmunda* growing in some boggy hollow of a wood. But to see it in numbers the Londoner must now go much further afield, to the margin of some valley stream, where the leaf-mould gathering round its tall thick rootstock raises large mounds from which its stately fronds rise to an additional height of five feet. At Killarney this stature would be reckoned dwarfish, for there *Osmunda* towers up to a height even of twelve feet. Each plant may have several crowns.

The frond is pinnate or bipinnate; the pinnæ about a foot long, broken up into a dozen or more pinnules, which are usually oblong-ovate in form with toothed margins. The finest fronds are the barren ones; those to which is assigned the office of spore-bearing, the uppermost pinnæ, are disguised owing to the leafy blades of the pinnules not having been developed; instead, great quantities of spore-cases have been produced from the raw material and are thickly clustered round the midrib of the pinnules and attached to the slightly developed veins. It is this clustering of the spore-capsules that has suggested to the popular mind the notion of a Flowering Fern, and by this name the plant is frequently known. The capsules are globose, with an incomplete contracted ring. The plant will be found in fruit from June to August. In spite of its substantial appearance and leathery substance, the frond completely shrivels up as winter approaches. *Osmunda* is a form of *Osmunder*, one of the names of Thor.

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Royal Fern.
Osmunda regalis.
— Filices. —
$^1/_2$ *nat. size.*

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Adder's-tongue Fern.
Ophioglossum vulgatum.
— Filices. —
$^1/_1$ *nat. size.*

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Adder's-tongue Fern (*Ophioglossum vulgatum*).

This singular fern is abundant and widely distributed, yet it is not nearly so well known to fern-collectors as some less plentiful kinds. This fact is explained by the small size of the plant and its general habit of growing where it is less distinctly seen. It is a plant chiefly of damp pastures and meadows, wet places on moors, and in woods, where it can find a stiff loamy soil.

Adder's-tongue springs from a short rootstock with fleshy, fibrous roots. From this arises in May a solitary frond, which is folded up in the reverse way of that usually adopted among ferns; it is folded lengthwise. The frond divides into two portions, one a broad, smooth, leathery, elliptic or oval blade, of a vivid green colour, covered by an intricate network of fine veins, but the midrib not present. The other portion of the frond is a slender flattened spike divided into a double series of globular capsules in which the spores are produced. These open by a transverse slit, and the spike is then said to resemble a serpent's tongue. If this spike is the origin of the name it is not easy to understand how it arose, for there is not the faintest resemblance between the two. There *is* some resemblance between it and the rattle of the rattlesnake, and it is possible that this organ introduced to this country by travellers before the snake itself was widely known, may have been palmed off as the tongue or "fang" of the snake. Popularly, though not actually, the tongue and the fang are the same, and it is only through some confusion of this sort that the name can be satisfactorily accounted for. But it is time that writers on ferns should cease to explain the name by stating that the likeness does exist. Even so good an authority as the late Mr. Thomas Moore, F.L.S., in his admirable "History of British Ferns," says: "The name *Ophioglossum* literally means Adder's-tongue, which is the English name borne by this plant. It is derived from the Greek *ophio, ophios*,

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a serpent, and *glossa*, a tongue; and is applied *in consequence of the resemblance of the fertile fronds to the tongue of a serpent.*" (The italics are ours.)

The frond appears about May, and by the end of the summer has disappeared again. There is a sub-species, the Dwarf Adder's-tongue (*O. lusitanicum*), about one-fourth of the size of *O. vulgatum*, with a more tuberous rootstock, the frond appearing in January; but, so far as the British Islands are concerned, it has only been found in Guernsey.

Spindle-tree (*Euonymus europæus*).

The Spindle rarely obtains recognition from the rambler until it opens its fruit in autumn; then it cannot be overlooked in the thick hedgerow or the copse, because its rosy fruit is so flower-like that it arrests attention. It is a shrub or small tree, growing from six to twenty feet, with opposite, glossy leaves. These are oval lance-shaped, finely saw-toothed, attached by a short stalk. The flowers are small (one-third of an inch in diameter), greenish white, with a persistent calyx that is cut into from four to six lobes. The short petals and the stamens agree in number with the lobes of the calyx, and are attached to a whitish fleshy disc, which has four to six lobes. The ovary has three to five cells, and bears a short style with a three to five-lobed stigma. The stamens mature before the stigma is ripe, and their filaments secrete honey. The flowers are grouped in cymes, containing from five to ten individuals, on a long peduncle arising from the axils of the leaves, and appear in May and June. After fertilization the ovary develops into a top-shaped fruit with from four lobes and as many cells, a single seed in each. In autumn when the leaves are turning yellow, afterwards to become red, these lobes which have now become pale crimson in hue, split open at their prominent angles and disclose the seeds surrounded by their bright orange

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Spindle-tree.

Euonymus europæus.

— CELASTRINEÆ. —

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arillode, similar but not exactly analogous to the mace (*arillus*) of the nutmeg. The whole aspect of the tree at this period is most attractive, but it should be noted that leaves, flowers, and fruit are alike reputed to be poisonous. The plant gets its English name, Spindle-tree, from one of the uses to which its wood is put—the manufacture of spindles. It is also valued on account of its toughness, for making skewers, shoe-pegs, charcoal for artists and for gunpowder-makers. From several of these uses it derives other names, such as Pegwood, Skewer-wood, and Prickwood. It is the only native species. The name is a slight variation of that given to it by Theophrastus, derived from *eu*, good, and *onoma*, name.

Alder Buckthorn (*Rhamnus frangula*).

We have two native species of Buckthorn, of which the Alder Buckthorn (*Rhamnus frangula*) is the more widely distributed. It is a shrub with slender branches, and grows to a height varying from five to ten feet. The leaves are oval, quite entire, alternate on the branches, with awl-shaped stipules. The few flowers are small, less than a quarter of an inch across, greenish white, springing from the axils of the leaves. The calyx is bell-shaped, the margin cleft into five lobes, and the lower portion lined by the disc which secretes honey. The five petals and five purple stamens are attached to the mouth of the calyx; the style is quite entire. The ovary develops into a black, globular, fleshy fruit, within which are two egg-shaped stones, each enclosing an egg-shaped seed. This form of fruit is technically a *drupe*, agreeing in structure with the Cherry and the Plum. *Rhamnus frangula* flowers in May and June, and may be found commonly in woody hedgerows, woods and thickets throughout England; it is local in Scotland, and of rare occurrence in Ireland.

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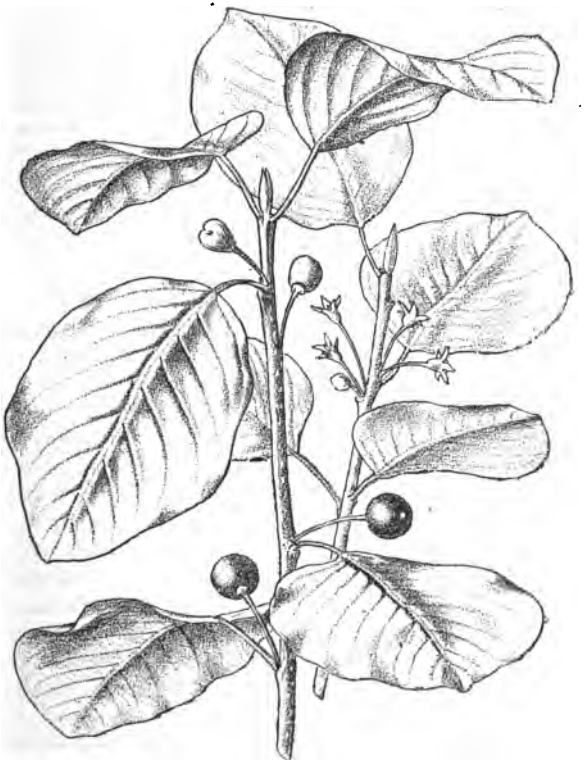

Alder Buckthorn.
Rhamnus frangula.
— RHAMNEÆ. —

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The drupes are used in dying, and the wood for gunpowder-making. An alternative name is Berry-bearing Alder. The other species is :—

Purging Buckthorn (*R. catharticus*), which differs from the commoner kind in having its branches sparingly armed with spines, its yellowish leaves sharply saw-toothed, nearly opposite, except at the ends of the shoots, where they are bunched. The parts of the flower are in fours, and the stamens and style are borne in separate flowers. The petals are yellowish green, and the style is cleft into four (sometimes two or five) branches. The drupe is a quarter of an inch in diameter (in *R. frangula* it is half an inch), and contains four stones, with curved seeds like minute horse-shoes. It flowers from May to July, and is found chiefly on chalk, south of Westmoreland, and rarely in Ireland. The berries are violently purgative. The name is the same as that used by the Greeks, and signifies a thorn-bush.

Horse Chestnut (*Æsculus hippocastanum*).

Though one of the most common ornaments of our parks, gardens, and other open spaces, the Horse Chestnut is not a native tree. Its home is believed to be in Asia, whence it was brought to Europe about three centuries since, and a few years later it was introduced to England. Here it appears to be perfectly acclimatized, for it attains a large size (fifty or sixty feet) and flowers magnificently. The general form of the branching leafy portion of the tree is a broad pyramid, supported by a tolerably smooth-barked trunk. So distinct is this tree that there is no difficulty in identifying it either in summer or winter. When absolutely bare of foliage it is still recognizable at a glance, for the very large buds and the curves of the branches distinguish it from all British trees. Those buds are liberally coated with a thick gum, that begins to melt under the first spring sunbeams ; such influence from without, and a swelling of the contents, soon cause the beautiful fan-leaves to unfold. They are divided into seven unequal but perfectly symmetrical leaflets, which are lance-shaped and saw-toothed. The leaves are opposite and *decussate*—that is, pair No. 1 point east and west ; pair No. 2, north and south ; pair No. 3, east and west, and so on with succeeding pairs. The object of this

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Horse Chestnut.

Æsculus hippocastanum.

— SAPINDACEÆ. —

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arrangement is economy of space, as will be seen on looking down upon a branch, the difference in the length of the leaf-stalks bringing three or four pairs of leaves almost to the same level, but with very little overlapping of margins. The flowers are arranged in large, erect, terminal panicles of pyramidal form. Individually the blossoms are irregular and unsymmetrical, snowy white in colour, streaked with yellow and red. The five sepals are united at their base, but the five petals are quite distinct. There are seven stamens, which are curiously bent—first downward, then upward—on account of the position assumed by the flowers; and the style is similarly curved. The globular ovary is three-celled, with two ovules in each cell; but as it develops into the well-known prickly bur, there is at most but one seed in each cell. More frequently one, and often two, of the cells do not progress beyond the most rudimentary stage, and the splitting valves disclose but one large seed. In spite of the similarity existing between the burs and their contents of Sweet Chestnut and Horse Chestnut, they are entirely different in character. In Sweet Chestnut (*Castanea*) the bur is a development of the involucre, which enclosed three ovaries; the sweet nuts are, therefore, so many *fruits*. In *Æsculus* the bur is the ovary, and the so-called nuts really *seeds*. The flowers appear in April or May.

The name *Æsculus* was originally applied to a species of oak that produced *esculent* acorns, but when or why it was transferred to this tree no one knows.

Needle-whin (*Genista anglica*).

Needle-whin is in some districts Needle-furze, Needle-Greenweed, or Petty-whin, the proper Whin being the Furze, described on page 11. It is a prickly, shrubby plant, with bright yellow blossoms, that grows freely on heaths and moors throughout the country. The slender branches spread in all directions

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Needle-whin. Petty-whin.

Genista anglica.

— LEGUMINOSÆ. —

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covered with spines and minute lance-shaped leaves. The spines vary from a half to one inch in length, and occasionally may be found branched. The flowers, which spring from the axils of the bract-leaves, are about half an inch long, have short footstalks, and are of the usual leguminose type of structure; that is to say, the five petals are of different sizes and shapes—the upper one (standard) being broader than the others, the two lowest uniting to form the keel, and the two intermediate being the wings. The significance of this type of structure will be found fully explained under the head of Broom in the First Series (page 7). The calyx is two-lipped, the upper one cut into two lobes, the lower shorter, with three short triangular teeth. The filaments of the stamens are all united to form a tube, and the anthers are alternately long and short. The seed pod is inflated, about three-quarters of an inch long, and pointed at each end. Flowers in May and June.

The other British species are two :—

I. Dyers' Greenweed, or Woadwaxen (*G. tinctoria*) Formerly of importance in the production of Kendal Green. Stems rigid, branched, but without spines. Leaves rather distant, with hairy edges, and awl-shaped stipules. Flowers pale yellow, almost stalkless. Pod, an inch or more long, thin, smooth. Pastures, meadows, and thickets on poor soil. July to September.

II. Hairy Greenweed (*G. pilosa*). A rare plant, not extending north of a line drawn from Suffolk to South Wales. Small, with many tortuous branches, and small yellow flowers. The leaves silky beneath. Pod, two-thirds of an inch, thin, downy. Gravelly heaths. May to September.

Name said to be from the Celtic, *gen*, a shrub.

Dwarf Cherry (*Prunus cerasus*).

Although the Cherries are included with the Plums in the genus *Prunus* (*see* First Series, page 109), and agree with them in most important characters, they are clearly separated from them by subordinate distinctions. The formation of flowers and fruit is the same in both sections, though externally the fruits differ, those of the Plums being covered by a waxy bloom, whilst those of the Cherries have glossy skins free from

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Dwarf Cherry. Wild Cherry.

Prunus cerasus.

— ROSACEÆ. —

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any such coating. But the principal ground of separation is afforded by the young leaf whilst still rolled up in the bud. In the Plum section this is *rolled* from edge to edge, but in the Cherries it is *folded* in two lengthwise.

The Dwarf or Wild Cherry (*P. cerasus*) can scarcely be called a tree with fitness, for it is of low stature (six or eight feet), and bushy at the base by reason of the numerous suckers that arise from the roots. It has red bark, slender drooping branches, and smooth, blue-green, coarse-toothed leaves with short stalks. The inner scales of the flower-bud are leafy, and the white flowers form an umbel. Petals notched and firm, not spreading open. Fruit round, red, with acid juice that does not stain ; thought to be the original form of our Morello, Duke, and Kentish Cherries. Copses and hedgerows south of Yorks. April or May.

The Gean (*P. avium*) is a taller tree, 20 to 40 feet, with a stout trunk. This species produces no suckers, and to accentuate its distinctness from *P. cerasus* its stout rigid branches curve upwards instead of down, and its pale green leaves are downy beneath, have long footstalks, and hang down from the twigs. The flowers are in umbels like those of *P. cerasus*, but open wide, and the petals are soft in texture. The calyx-tube is narrowed at the top ; none of the bud-scales leafy. The black or red fruit is more heart-shaped, the flesh firm and not easily separating from the stone, not very juicy, bitter or sweet, not acid. The juice stains. The flowers appear in April or May, and the tree may be found in woods and copses as far north as Caithness. It is thought to be the parent of our Black-hearts and Bigaroons.

The Bird Cherry (*P. padus*) is distinct from the other species, in having its leaves heart-shaped at the base, and its flowers in loose racemes which spring from lateral buds. Petals with ragged edges. Fruit small, egg-shaped, black and bitter. Woods and copses in Midlands and North Britain. April and May.

Bramble (*Rubus fruticosus*).

In the First Series of this work we gave an illustration of the Dewberry, which is a sub-species of Bramble, without description, as we were then pressed for space and felt that everybody but a botanist knows the Blackberry and the Dewberry at sight. This remark sounds like a paradox, and may

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Bramble. Blackberry.

Rubus fruticosus.

— ROSACEÆ. —

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be explained by saying that the two plants, which every country schoolboy can separate without hesitation, vary so greatly in small points that botanists are far from being agreed whether these departures from the typical form shall be regarded as varieties or as distinct species. Professor Babington puts the number of British species of Bramble at forty-one; Mr. J. G. Baker (in Sir J. D. Hooker's "Student's Flora") reduces these to four species, of which one is the Blackberry (*R. fruticosus*), with twenty-two sub-species and several varieties of almost every one of these. Other authorities contend for various numbers between four and forty, so that the unprofessional botanist who favours the "splitters" must be prepared to devote a large portion of his life to this one genus, and thereby, we fear, lose much of the pleasure that the ordinary study of plants will give him. Should any of our readers desire to become Bramble specialists we do not think they will find a better guide than Mr. Baker's arrangement; but we suspect that most will prefer to regard each of these variations as being equally *Rubus fruticosus*.

The Bramble, like the Cherry, is one of the Rose family, and its flowers have the general characteristics of the order. The calyx forms a broad tube with five persistent lobes; the petals five in number, white or pink; stamens many. The numerous carpels are grouped upon a conical receptacle, each containing two ovules, of which only one develops into a seed. The fruit is a black or purple drupe like the Cherry, but very minute and stalkless, a large number being clustered together on the receptacle. It flowers from June to September, and abounds everywhere. The stems are thick and fleshy, liberally studded with hooks, prickles, bristles or gland-tipped hairs. They have a habit of growing half-erect, to a great length, then arching over till the tip touches the earth, when roots are emitted and a new plant arises. Sometimes a thick stem will run straight up a tree trunk and root in the moss and leaf mould

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that have gathered at the forking of the branches ten feet above. The leaves are compound, usually with three or five leaflets, arranged pinnately, more or less oval, toothed, dark-green above, paler beneath.

The other species recognized by Baker are :—

I. Wild Raspberry (*R. idæus*). Stems round, 3 to 5 feet, whitish, with straight, slender prickles; leaves white beneath. Calyx lobes with long tips; petals short and narrow, white; flowers drooping. The drupes are many in a cluster, red or yellow, and hoary. Flowering from June to August. Woods and heaths.

II. Cloudberry (*R. chamæmorus*). Stem erect, rough, but devoid of hooks or prickles, 4 to 8 inches. Leaves few, *undivided*, broadly heart-shaped, margin lobed. Flowers solitary; pistillate and staminate flowers on separate plants (*diœcious*); white, 1 inch across. Sepals and petals oblong. Fruit orange-yellow, consisting of a few large drupes. Flowers June and July. On high moors northward of Derby and Wales.

III. Stone Bramble (*R. saxatilis*). With creeping rootstock and runners; stems of two kinds—one lying prostrate, 2 or 3 feet long, produces leaves and bristles only; the other erect, from 6 to 18 inches, produces a few small white flowers, with very small petals. Leaves few, trifoliolate, downy, doubly toothed. Fruit consisting of two or three crimson drupes. Flowers June and July. Stony places in copses and by streams in mountainous districts of the west and north only.

Wild Service (*Pyrus torminalis*)

The Service tree is of local occurrence, and not even that northward of Lancashire. Where it is found it is probably often passed by as one of the more frequent members of the genus Pyrus. It may be readily identified, however, by means of its handsome leaves—twice the size of those figured in our illustration. They are ornamented by from seven to eleven bold triangular lobes, like huge teeth, themselves nicked with saw-teeth along their edges. When young these leaves—like the shoots—are downy, but when full-grown are smooth on either surface. This character of the mature leaf is quite sufficient to separate the tree from the White Beam (*P. aria*), already described (see page 36). The flowers are white, about half an inch across the petals; a few combined in a corymb, and many corymbs into a compound cyme. These appear in

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April or May, and are succeeded by fruits that vary in form from some approach to pear-shape to more or less rotundity. They are greenish brown when ripe and marked with little dots. The specific name of the tree (*torminalis*) is the Latin for anything that causes griping of the intestines, and from this explanation the reader may form some idea of the character of the fruit. We have never eaten it, but it is said to have a rough, acid flavour, and to be not disagreeable when it has commenced to decay, and has been bitten by frost. When in this condition it sometimes finds its way to the markets of country towns. The tree has been known to exceed fifty feet in height, but is usually much less than that. It is a tree of the copse and hedgerow.

The true Service-tree (*P. sorbus*) is not a native, nor is it commonly grown here, though it is common in France and Italy. Its flowers are small and cream-coloured, but the fruits are larger than those of *P. torminalis*.

Medlar (*Pyrus germanica*).

A brief reference to the Medlar will complete our consideration of the genus *Pyrus*. It is not an indigenous tree, but a native of Persia, Greece, and Asia Minor, that has been introduced for the sake of its fruit, and from the cultivated trees the seeds have been carried by birds and sown in the hedges. This supposition appears to be warranted by the fact that though the Medlar is frequently found as a hedge tree, it does not occur in woods, as it probably would if really native.

Pyrus germanica grows to a height of from ten to twenty feet, with spreading branches that are all elbows and spines, the shoots having the habit of starting off at right angles in any direction, which gives the branches a fantastic appearance. The leaves are oval lance-shaped, with entire or toothed margins, downy beneath, and slightly so above. The flowers

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Wild Service.
Pyrus torminalis.
— ROSACEÆ. —

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are solitary, white, an inch and a half across. The calyx is woolly, the lobes ending in leafy tips, and the disc being broad and open. The fruit is brown-skinned, about an inch across, with a depressed top. It is not fit for eating when newly gathered, but must be laid aside to "blet"—that is, until the flesh has commenced slightly to decay. It flowers in May and June, and may be found naturalized in the South of England and the Midlands.

Dogwood (*Cornus sanguinea*).

This frequent constituent of the hedge and thicket in Southern Britain has several names in addition to that printed above: Wild Cornel, Dogberry-tree, Hound's-tree, Dagwood. It now receives but scant consideration, though it is admired in autumn, when its deep-red bark and intense crimson leaves attract attention; but it is a wonderful plant for utility. It is a downy shrub, attaining to a height of six or eight feet, with stalked, oval, entire, opposite leaves. Flowers small, dull white, in dense terminal cymes; each consisting of a calyx represented by four minute teeth, four petals with lateral margins rolled back, four stamens, and a two-celled ovary which develops into a small, black drupe. It flowers in June and July. The hard wood is used for making skewers, tool-handles, and gunpowder; in former days the arrow-makers valued it. The bark of several species is said to have similar virtues to those of Cinchona; and drunkards use a tincture of the berries as a "pick-me-up." The powdered bark, or the fresh twigs with the bark removed, is recommended as a capital dentifrice, and a decoction of the bark makes a good wash for a mangy dog. There is another British species:—

Dwarf Cornel (*C. suecica*). Found only in Highland bogs and Alpine pastures, growing to a height of 6 inches only; not shrubby, but herbaceous. It has a creeping rootstock, an erect, four-angled stem, stalkless, opposite leaves, minute

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Medlar.

Pyrus germanica.

— ROSACEÆ. —

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purple flowers in an umbel, with four white bracts, drupes red. Flowers July and August.

The name of the genus is from the Latin, *cornu*, a horn, the wood being considered as hard and durable as horn.

Guelder Rose (*Viburnum opulus*). Plate 140.

The Guelder Rose is a shrub of the moist copse and the waterside, growing to a height of about eight feet, with opposite slender branches and opposite leaves. The leaves are unequally three-lobed, deeply toothed, stalked, and with very slender stipules; before full expansion they are downy. The flowers consist of a calyx with five minute teeth, a five-lobed corolla, five stamens, and an ovary with two or three cells, but which develops into a one-celled, one-seeded fruit. These flowers are honeyed and small, are associated in large, convex cymes, from two to four inches across, which will be found during June and July. We have here an instance of that remarkable co-operation among flowers so noticeable in Composites, by which certain flowers in a group are specially modified for the purpose of advertising the concern to the insects whose services are desired to assist in fertilization. The flowers forming the mass of the Guelder Rose are about a quarter of an inch across, creamy white, and containing both stamens and stigmas; but those constituting the marginal series are more distinctly white, three times the size of the inner, and quite destitute of sexual organs. In the cultivated form—the Guelder Rose or Snowball-tree of our gardens—the whole of the flowers have become thus sterile, and the cluster assumes a globular form. The flowers are succeeded by roundish, clear red drupes. There is another British species :—

The Wayfaring-tree (*V. lantana*), with coarse, downy, broad heart-shaped leaves without stipules. It grows from 6 to 20 feet high, and its small, white flowers are all perfect. The drupes that succeed them are flattened laterally, coloured first orange, then red, finally black. It is a common hedge shrub in chalky districts south of Yorkshire, and flowers in May and June, though the flower-buds appear quite early before there is any sign of leaves.

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Dogwood. Cornel.
Cornus sanguinea.
— CORNACEÆ. —

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Elder (*Sambucus nigra*).

In a wild state the Elder will be found growing in damp hedges and thickets. It is a great lover of moisture, and given a fair amount of this, the young elder plants will make astonishingly rapid growth. At a year old its stems are as stout as those of other trees after two or three years' growth. It is true it is not all solid wood, but a tube of wood with a thick core of pith, which is easily removed. It has a grey, corky bark and ornamental foliage, which gives the tree a light, picturesque appearance. The leaves are pinnate, the lance-shaped, saw-toothed leaflets being arranged in from two to four pairs, with a larger terminal leaflet. About June the foliage is almost hidden by the luxuriant masses (*cymes*) of creamy, strong-smelling flowers. These cymes are flat-topped (resembling umbels), with five rays, and measuring from four to six inches across. The individual flowers are jointed to their footstalks, and both calyx and corolla are tubular by the cohesion of the floral leaves. The calyx-mouth ends in three or five teeth, and the corolla in as many spreading, rounded lobes. Stamens five, with slender filaments ; ovary three to five-celled, developing into a purplish-black, globular berry (sometimes greenish-white) of mawkish flavour, but which some persons affect to like when it has been fermented and turned into Elder-berry wine. Properly disguised this is said to be largely used in the manufacture of " Port wine "—not so much that which is made in the neighbourhood of Oporto (though even that often owes its rich colour to Elder-berries), but to the prime sorts made in this country, and supposed to have come from Portugal. The leaves, the flowers, and the berries of Elder are still used in rustic medicine, but formerly they were regarded with much more favour in this respect. John Evelyn said there was scarcely an ailment could beset a man but recourse to the

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Guelder Rose.

Viburnum opulus.

— CAPRIFOLIACEÆ. —

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Elder would give him a remedy for it. An old name for it was Bore-tree, owing to the ease with which its branches could be bored by pushing out the pith. There is one other native species :—

Dwarf Elder, Dane's-blood, or Dane Wort (*S. ebulus*). Herbaceous, not woody, its numerous grooved stems scarcely exceeding 4 feet in height. The leaves are larger, the leaflets being from 4 to 6 inches long, and four or six pairs. But the cymes are not much more than half the size of those of *S. nigra*, and but three-rayed. The corolla, too, is bell-shaped, white, tipped with pink. The berries are nauseous and violently purgative, as indeed is the whole plant. Its unpleasant character, as well as certain of its names, are accounted for by the legend that it sprang from the blood of our Danish conquerors.

The name of the genus is Greek, and is supposed to be derived from *sambuke*, an ancient musical instrument said to have been made from Elder-wood.

Privet (*Ligustrum vulgare*).

With the exception of the Ash (see First Series, page 136), the Privet is the sole representative in this country of the important order Oleaceæ, which includes the Olive and Lilac. The Privet, or Prim (*Ligustrum vulgare*), may be found frequently growing in thickets and copses as well as hedgerows, but in most places it is merely naturalized. When, however, it is thus found in chalk districts and along the sea-cliffs it may be regarded as truly indigenous. As seen in garden hedges, where the clipping shears are freely used, it is a stiff, broom-like plant, but in a natural state it is much more free in its growth, and attains a height of eight or ten feet. The slender branches are smooth, the leaves opposite, glossy, narrow-lance-shaped, in some situations evergreen, the margins quite free from lobing or teeth. The flowers are white, in terminal panicles, and appear in June. The tubular calyx ends in four teeth. The corolla is funnel-shaped, with four lobes, not more than a quarter of an inch across. Stamens two, attached below the egg-shaped ovary. The fruit is a purple-black, globular berry, with oily flesh, from which an oil is pressed. A search amongst the stems is likely to yield the large, handsome larva of the

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Elder.

Sambucus nigra.

— CAPRIFOLIACEÆ. —

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beautiful Privet Hawk-moth (*Sphinx ligustri*), which feeds upon the leaves.

Ligustrum is the ancient Latin name for Privet, or Withwind, and is derived from *ligo*, to bind or tie up.

Bay Laurel (*Laurus nobilis*).

To so many shrubs the name Laurel has been given, with some qualifying prefix, that it would puzzle many a townsman to-day to guess correctly which among them all is the Laurel of antiquity, with which the victor's brows and the statues of the gods were wreathed. The species figured here is the true and only original Laurel, the Bays wherewith the poets as well as heroes were crowned; and no doubt the Latin name *Laurus* was itself derived from *laus*, praise. The Bay, Sweet Bay, or Noble Laurel (*Laurus nobilis*) is a native of the extreme South of Europe, but it has been cultivated as a hardy, fragrant evergreen in this country ever since the year 1562. The leaves give out a spicy aroma, which makes them to be coveted even of the cook for the flavouring of certain dishes. Extremes meet, and the leaf that graces the brow of the poet and the hero, serves also to minister to the delight of the gourmand! It may occasionally be met in public gardens and private plantations; but the best specimens for size are likely to be found in the garden of some ancient house; though in all probability it will be cut into an arch or arbour, or some other unnatural form. In its native regions it attains to a height ranging from thirty to sixty feet. Its oblong lance-shaped leaves are alternate, dark green and feather-veined. The flowers are small and inconspicuous, produced in axillary clusters early in spring; some of them unisexual, others bisexual. There is a yellowish perianth whose base is persistent, and invests the dark purple berry that was once the ovary. The

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Privet.
Ligustrum vulgare.
— OLEACEÆ. —

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perianth is four to six lobed, and there are twelve stamens. The berry is as large as a cherry, succulent.

This is the only species of the genus the wayfarer is likely to meet, *Laurus benzoin*, the only other member, being rarely grown even in gardens.

Box (*Buxus sempervirens*).

Though Box is common enough in gardens as an edging or a shrubbery plant, and is naturalized in many woods and plantations throughout the country, it is only in the counties of Gloucester, Bucks, Kent, and Surrey, that it is considered by the authorities to be truly native. Box Hill in Surrey is its most famous habitat in this country, and there one may see it growing freely, not as a bush, but as a tree twelve feet high, with a stout trunk. There one may wander along winding walks above the precipitous western flank of the hill, and gather many an uncommon plant of more modest growth, and perhaps —it is a matter of individual taste—enjoy the peculiar aroma given out by the young leaves under the influence of sunshine. We consider the odour a pleasant one, so long as it is not too strong.

The evergreen leaves are oblong, glossy, opposite on the stem, an inch or less in length. The small, whitish flowers spring in crowded clusters from the axils of the leaves, and are of two kinds—male and female. The males consist of four sepals, and four stamens springing from the base of the rudimentary ovary. The female flowers occur singly at the summit of a group of males, and consist of from four to twelve sepals, a three-celled globose ovary, with three styles. The fruit is a three-celled leathery capsule, about half an inch in diameter. The very fine-grained, hard, and heavy wood is used by the engraver of "woodcuts" and the manufacturer of small fancy wares. It should be noted that the plant shares

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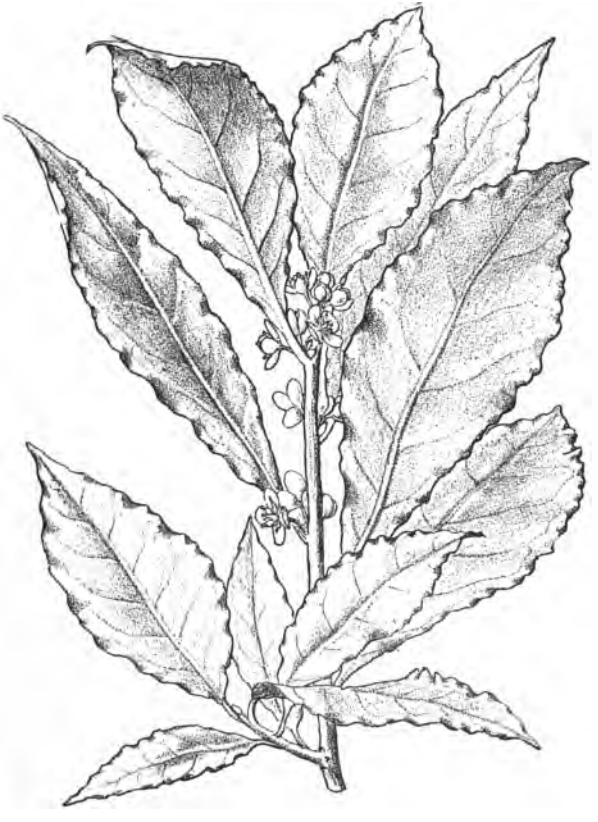

Bay Laurel. Sweet Bay.

Laurus nobilis.

— LAURINEÆ. —

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the general character of the order Euphorbiaceæ—to which it belongs—in being poisonous. This is the only native species.

The name of the genus is from the Greek name for the tree, *puxos*.

Walnut (*Juglans regia*).

In some districts of Southern England grand old Walnut trees may be encountered growing in hedges by the public roads. Whether these have been planted accidentally by squirrels or purposely by some forgotten philanthropist is past finding out; if the latter, his object is in all probability now defeated by the owner of the hedge collecting the fruit before it falls. We have seen the fruit being gathered from such a wayside tree in Surrey, by threshing the branches with long poles; a sight which brings forcibly to mind, and partly explains, the old saw—

> "A dog and a wife and a Walnut tree,
> The more they are beaten the better they be!"

In the case of the Walnut—we can say nothing of the other subjects—the effect of the beating is to break the smaller twigs as well as to knock off the fruit, and so the tree gets a rough kind of pruning which tends to greater productiveness.

The Walnut attains a height of fifty or sixty feet, and a considerable girth. Its pinnate leaves are very fine, for size, boldness of division and habit. The oval lance-shaped leaflets vary in number from five to nine, and give out a spicy aroma when touched. Unfortunately, they fall off at the first touch of frost. The greenish flowers appear early in spring before the leaves, the sexes in separate flowers, but on the same tree. The male flowers are in simple catkins, and consist of a calyx of five or six scales, enclosing a large number—from eight to thirty-six—of stamens. The calyx of the female closely envelops

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Box.

Buxus sempervirens.

— EUPHORBIACEÆ. —

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the ovary with its two or three fleshy stigmas, which develops into the hard-shelled nut and its succulent husk.

The name of the genus, *Juglans*, is derived from *Jovis*, Jupiter, and *glans*, an acorn, and has been explained by the tradition that in the Golden Age, when men fed upon Acorns, the gods ate Walnuts. The tree is not a native, but was introduced from Persia about 350 years ago.

Bog Myrtle (*Myrica gale*).

Sweet Gale, Dutch Myrtle, and Candle-berry Myrtle are other names for the plant represented on the opposite page. It is a shrub which grows from two to three feet high, and delights in bogs and damp moors. The leaves are lance-shaped, with the broadest part uppermost, shortly stalked, and toothed. They are yellow-green in colour, alternate on the branches, and downy beneath, secreting a wax which gives off a pleasant fragrance under the sun's influence. The flowers have neither calyx nor corolla; they are gathered in a kind of catkin, with mere scale-like, concave bracts, the sexes on separate spikes, usually on different plants. The male spikes are about an inch in length, erect, and crowded; the stamens usually four to each bract, the anthers red. The female spikes are only a quarter of an inch long; the ovaries one-celled with two bracts, two thread-like styles that are stigmatic all over, and of a red colour to match the anthers. The fruits are of the kind called *drupes;* that is, like a cherry or plum, with a fleshy outside and a bony inside. Popularly they are berries, and they get their name of Candle-berries from the fact that they are coated with waxy resin. These are boiled in water, and the wax, of course, floats to the top, to be skimmed off and made into small candles, which in burning give off an aromatic odour. The leaves contain a bitter principle and are said to be used in lieu of hops for Highland brewing.

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Walnut.
Juglans regia.
— JUGLANDEÆ. —

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This is the only British species; it flowers from May to July. The name is from *murike*, the Greek name for the Tamarisk.

White Poplar (*Populus alba*).

The Poplars and the Willows between them constitute the Natural Order Salicineæ, all agreeing in having alternate, undivided leaves that fall off in autumn, the male and female blossoms being borne in catkins by different trees; but differing in that the Poplars have broad leaves and drooping catkins whose scales are cut or toothed, whilst the Willows have narrow leaves and erect, honeyed catkins with entire scales.

Though the White Poplar or Abele tree (*Populus alba*) is admitted into the British flora, some doubts are entertained as to its claims to be regarded as a genuine native. The Aspen (*P. tremula*) is accepted as truly indigenous, but in that case the specimens met with are far more frequently trees that have been planted.

The White Poplar grows to be a large tree, sixty to a hundred feet in height, with smooth grey bark and spreading branches. The young shoots are covered with down, and the leaf buds are cottony and free from stickiness. A great number of suckers spring up around the tree, and these bear leaves differing in form from those of the branches and the young shoots. The sucker-leaves are of a somewhat triangular general form, lobed and toothed, three or four inches across; those of the branches smaller, broad egg-shaped, heart-shaped at the base, with wavy margins, and white cottony on the underside; whilst those of the shoots are more or less lobed. The leaf-stalks are long, slender and flattened at the sides, which causes the leaves to twist a good deal in a slight breeze, and show their white undersides, thus affording a ready way of distinguishing the tree at a glance. The male catkins are from two to four inches

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Bog Myrtle. Sweet Gale.

Myrica gale.

— MYRICACEÆ. —

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long, cylindric, the flowers containing from six to ten stamens with purple anthers. The female catkins are shorter, oval, dense, the scales fringed with fine hairs, and containing four slender, yellow stigmas. The catkins appear in March and April. The tree is of rapid growth, but its wood is not greatly esteemed, though it is light and does not readily burn, a character that, while it renders it unsuitable for firewood, recommends it for flooring and so forth. It grows in moist situations.

Grey Poplar (*P. canescens*) is regarded as a sub-species of *P. alba*, having the sucker leaves angled and toothed, whilst those of the branches are smooth or hoary, not cottony, beneath. The stigmas usually four, occasionally two, all four-lobed. It is also thought this may be a hybrid between *P. alba* and *P. tremula*.

Aspen (*Populus tremula*). Plate 148.

The Aspen agrees with the Abele in the character of its buds and young shoots, also in having grey bark and poor wood. It attains various heights between forty and eighty feet, though rarely exceeding fifty feet; the trunk very erect. The leaves are almost circular, smooth above, somewhat silky beneath (those of the shoots cottony), with uneven, wavy saw-teeth, and very long, slender, smooth, compressed leaf-stalks. It is the extreme length and slenderness of these that give to the Aspen its proverbial reputation for ceaseless quivering so dear to the poets. The branches of the tree are spreading, until they become old, when they droop at the extremities. The leaves vary in size from one to four inches in diameter. The catkins are smaller than those of *S. alba*, the scales deeply cut, the stamens about eight in number, and the stigmas two, each cleft into two. These appear in March or April, and the tree, which is a rapid grower, will be found in damp copses through the country, in most cases planted by man.

There are several varieties :—var. *villosa*, with the foliage covered with long weak hairs; var. *glabra*, with the leaves less hairy or silky than the type; var. *pendula*, differs only in having more drooping branches, and appears to be of nursery origin.

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White Poplar. Abele.
Populus alba.
— SALICINEÆ. —

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Black Poplar (*Populus nigra*).

Although the Black Poplar is not a native of Britain, it is one that we are constantly coming across, owing to the frequency with which it is planted. It is a native of Europe and Northern Asia, and its recommendation to English growers lies chiefly in its very rapid growth. Its names, both popular and scientific, are misnomers, for there is nothing black about the tree, except when it is planted in smoky cities. These names are given merely because the white or grey hairs of *P. alba*, *canescens*, and *tremula* are absent from the leaves and shoots of *P. nigra*. It would seem as though its sponsors had agreed that as the absence of light causes darkness, so the absence of white must cause blackness; but in this case it merely reveals the otherwise-hidden greenness. The tree attains a height between fifty and eighty feet, but as its growth is rapid, so is its duration short. It has grey bark, spreading branches, but no suckers; this last is a point in which it differs from *P. alba* and *P. tremula*. A further distinctive mark will be found in the character of the buds and the young shoots. In the previously mentioned species the shoots are downy and the buds free from stickiness; in *P. nigra* the shoots are smooth, free from down, and the buds are covered with a sticky varnish. The leaves are variable in outline and scarcely conform to any of the ordinary geometrical shapes. They have been described as "triangular-ovate," "rhombic," "deltoid," "suborbicular." We incline to the rhomb as best describing the form of the leaves early in the season, but even the angles incline all sorts of ways, and as the leaf gets larger it becomes more rounded at the base and less angular. In the young state, too, it is silky beneath, and silky hairs like eyelashes fringe the edges. Ultimately the silky hairs vanish and the leaf becomes nakedly smooth, the edges finely toothed.

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Aspen.
Populus tremula.
— SALICINEÆ. —

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The male catkin is cylindrical, two or three inches long and pendulous; the stamens from twelve to twenty, with purple anthers. The female catkin is shorter and more erect, the scales distant, nearly smooth and not deeply cut at the edges; the two roundish stigmas two-lobed. The flowers appear in April, and the tree will usually be found planted in damp places, such as the banks of rivers and streams. The bark of this tree is used like that of the Oak for tanning, and the wood, which is very light, is in request by the turner and the charcoal burner. By some authorities *P. nigra* is held to be a variety of *P. fastigiata*, the Lombardy Poplar.

White Willow (*Salix alba*).

We have already (see First Series, page 146) mentioned the difficulty the botanical student has to encounter when he attempts to determine the species of Salix, but unless he wishes to go seriously into the matter as a "splitter," the rambler must be content with knowing the distinguishing characteristics for a few of the commoner and more definite forms. The White Willow (*Salix alba*) is a familiar object by riversides and the margins of streams, too often pollarded, though even under such treatment it is not without picturesque character, as any artist will admit. But we prefer to see it with head uncropped, at a height of sixty or eighty feet, and with a trunk of ample girth—it may be found of twenty feet circumference—covered with cracked bark. The pliant branches are well clothed with the elegantly shaped narrow leaves, running off to a sharp point at either end, and evenly saw-toothed. Except when the leaves are old they will be found to be clothed with silky hairs on both surfaces. They vary from two to four inches in length, and the underside is white from the abundance of the silky hairs. The catkins appear with the leaves in May, and are erect, slender and loose, and the scales exceedingly narrow; stamens two.

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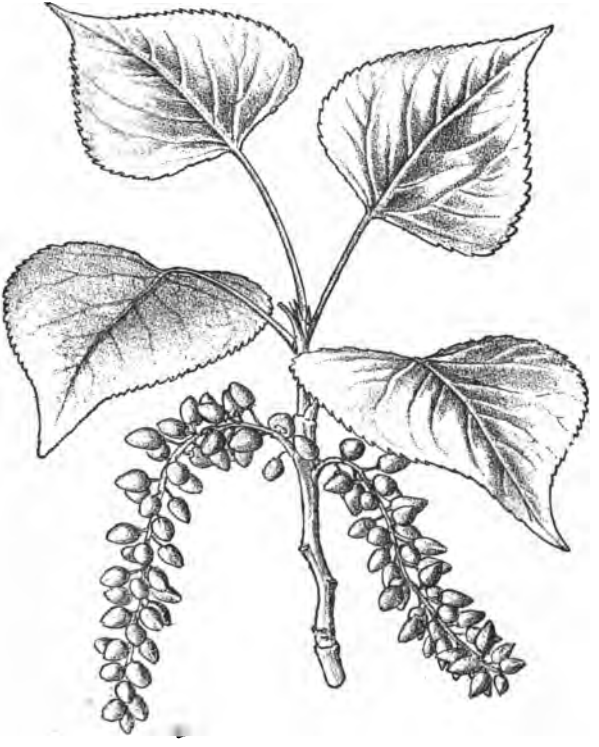

Black Poplar.
Populus nigra.
— SALICINEÆ. —

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There are three natural varieties, which may be thus briefly distinguished :—The type, *alba* proper, with young shoots olive green, and the old leaves remaining silky on both sides; var. *cærulea*, shoots olive, old leaves smooth, the under surface of glaucous tint; var. *vitellina*, the Golden Willow, with bright yellow or reddish twigs, upper surface of old leaves smooth, and the scales of catkins longer than in the type.

The White Willow is a rapid grower, and its timber is valuable to the carpenter for its tough, durable, and light qualities. It exhibits no tendency to split upon slight provocation, and therefore finds many uses for which less elastic woods are unsuitable, such as the making of chip hats and chip baskets, hat boxes, and so forth. The contriver of crab-pots prefers before all others the twigs of var. *vitellina* for his work. The tanner, too, values its bark on account of its rich astringent qualities, and from it the chemist extracts the silky needle-shaped crystals of *Salicin*, which has tonic properties similar to those of Sulphate of Quinia, and proves valuable in dyspepsia and ague.

Salix is the ancient Latin name for the Willow and Osier.

Common Sallow, or Goat Willow (*Salix caprea*).

The Goat Willow is well known to all ramblers in rural districts in the early part of the year, but then it is not Goat Willow or Sallow, but Palm. The stiff leafless twigs are studded with the soft silver-grey, egg-shaped catkins long before there is any sign of a leaf. A little later the silver is hidden by the golden anthers, and the tree is musical with the cheerful humming of the bees, humble and domesticated, that swarm around it. At night, too, it is the rendezvous of all the moths that have been hibernating in the neighbourhood, and have been awakened from their slumbers by the seductive fragrance of Sallow-nectar. The female catkins increase in length to about three inches, and then nod; the stout male catkins do not exceed an inch. This is the earliest flowering of all the Willows.

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White Willow.
Salix alba.
— SALICINEÆ. —

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The Goat Willow does not grow nearly so large as the White Willow, and even at its best, when allowed to grow into a tree, it does not exceed forty feet in height; but more commonly it is, by constantly lopping off the twigs, kept down to the dimensions of a mere bush in the hedge. The branches are purplish-brown when mature, but in a young state are covered with a grey down. The leaves vary much in form, but are broader than those of the White Willow; some lance-shaped, others oblong or rotund, cottony beneath, and with toothed edges.

There are a number of varieties, which may with difficulty be distinguished from the type by considering the leaves. Those of *S. caprea* proper are broad, smooth, and of a dull green, with wavy, toothed margins. The sub-species, *S. cinerea*, has woolly twigs and buds, smaller and narrower leaves with wavy margins, downy on the upper side; male catkins more slender, with yellow anthers.

Cedar of Lebanon (*Cedrus libani*).

We are most likely to come across this noble conifer when we pass through some private park by the public path that survives to tell of the days when the park was a common. About a hundred yards from the path the Cedar towers in massive, picturesque beauty to a height of seventy or eighty feet, and beneath its wide-spreading, fan-like branches a small herd of fallow-deer are feeding and resting. Although there is little difficulty in identifying young Cedars when seen, they are very variable trees at different periods of their growth, and Sir Joseph Hooker is of opinion—based on his examination of the trees in their native countries—that the three so-called species are but varieties of one species; on this point, however, there is disagreement between the authorities.

Cedrus libani appears to have been introduced from the

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Sallow. Goat Willow.

Salix caprea.

— SALICINEÆ. —

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mountains of Syria in the year 1683. The celebrated grove on Mount Lebanon is now preserved—thanks to the late Rustem Pasha—and contains about four hundred specimens. Many more than that number of fine examples could be found in England to-day. With us it has proved perfectly hardy, growing to a large size and ripening its massive cones, a process that takes three years to complete. These cones are from three to five inches long, a couple of inches in diameter, blunt topped, purplish-brown in colour, the scales thin, short, an inch and a half wide, closely pressed together. Sometimes the cone, instead of being bluntly pointed as in that figured, is slightly hollowed at the top. The thick boughs spread horizontally, and the short, thick leaves, of a dark green colour, are evergreen and rigid. The trunk attains a girth measurement of forty feet. The other species, or varieties, as we may choose to call them, are :—

I. Indian Cedar (*Cedrus deodara*). Deodar. Introduced from the Himalayas in 1822. Young tree pyramidal, with slender, *drooping* branches densely clothed with glaucous foliage. Cone sheds its scales as soon as the seeds are ripe. A taller, less massive tree than *C. libani*, attaining a height of 100 to 150 feet, but with a girth of from 20 to 30 feet only. Leaves longer and more distinctly three-sided.

II. Atlas, or Algerian Cedar (*C. atlantica*). Introduced from Atlas Mountains, 1843. Whatever we may say as to the distinctness of *C. libani* and *C. deodar*, it is difficult to give characters to separate *C. libani* and *C. atlantica* satisfactorily. The chief distinction is to be found in the more erect, pyramidal habit, and in the length of the leaves, which are shorter in *atlantica*, usually less than 1 inch long, glaucous or silvery. Height 80 to 120 feet. Also called African and Silver Cedar.

Kedros is the ancient name of *C. libani*.

Yew (*Taxus baccata*).

Wherever we may come upon a Yew with massive trunk, in country churchyard, or on the Pilgrims' Way, along the chalk ranges of Surrey and Kent, we may be sure we are face to face with a living connection between our own day and the far past. The Yew is a tree of exceedingly slow growth, and its annual rings are consequently very thin, and the wood fine-grained.

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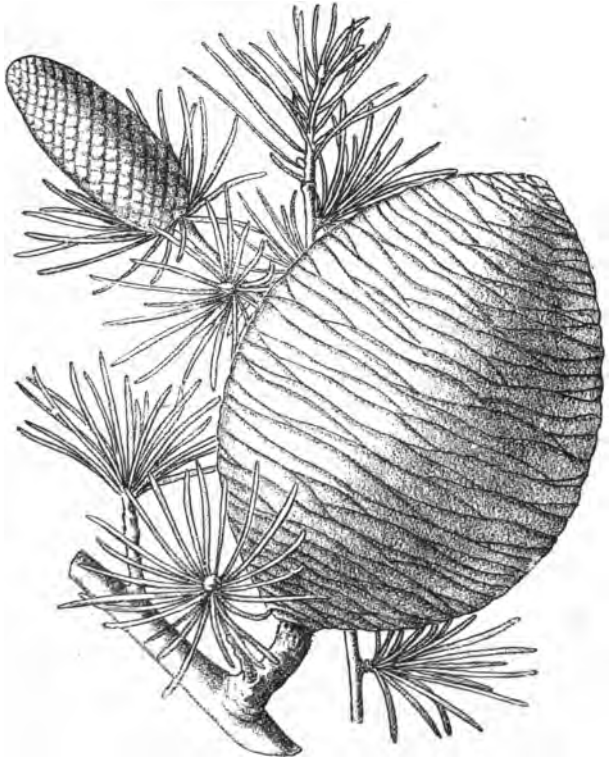

Cedar of Lebanon.
Cedrus libani.
— CONIFERÆ. —

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It is a low-growing tree, scarcely exceeding fifty feet in this country, and many of our specimens are of much less stature. The trunk is deeply channelled, covered with a thin, reddish-brown bark that readily flakes off. Unlike most trees, it does not wait until it has attained a fair height before branching, but at a few feet from the ground it gives off horizontal, spreading branches, well covered with leafy twigs. The leaves are very narrow, leathery, dark green and glossy above, pale beneath, thickly set in two rows on opposite sides of the twig. The male flowers grow on a different tree from that which bears females. The male flowers are globular catkins, a quarter of an inch long, resembling yellow scaly buds, with five to eight anthers. The female are much smaller, solitary, with green scales at the base. Within there is a solitary seed on a fleshy disc, which enlarges into a mucilaginous cup of a bright red colour. These fruits, when nearly ripe, are most conspicuous in contrast with the dark hue of the foliage; when quite ripe they fall. The juice of the fleshy cup is sweet, but scarcely agreeable to the taste, though children consume them. The foliage is poisonous, but produces different effects on different animals, and the young shoots contain the most virulent poison. Yew-leaves produce similar effects on the human subject to those of *Digitalis*, though, unlike that principle, it is not a cumulative poison.

Many ingenious and interesting reasons have been given to explain the presence of old Yews so frequently in churchyards, some finding in its sombre hue and poisonous character a type of death; others see life and the resurrection symbolized in its great age and scarcely perceptible growth. Some thought that the decoration of the churches with its branches was the reason for having it always at hand. Again, it has been conjectured that the Yew trees marked the sites of heathen altars, upon which Christian churches were subsequently built; but this seems only to push the difficulty back a little. Then there

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Yew.

Taxus baccata.

— CONIFERÆ. —

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are those who say that the Yew was so planted that there might always be sufficient of its tough wood at hand to make long bows for the defence of the parish.

Specimens have been recently existing in this country with a girth of over fifty feet, and whose age has been computed at over a thousand years.

Much doubt exists respecting the derivation of the name of the genus, but it probably has allusion to the use of the wood for making bows, which dates from very early times; and *Taxus* is therefore reasonably thought to be derived from the Greek, *toxon*, a bow or arrow.

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NATURAL ORDERS, GENERA AND SPECIES

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NOTE.—Orders and Genera marked * have no British representatives.

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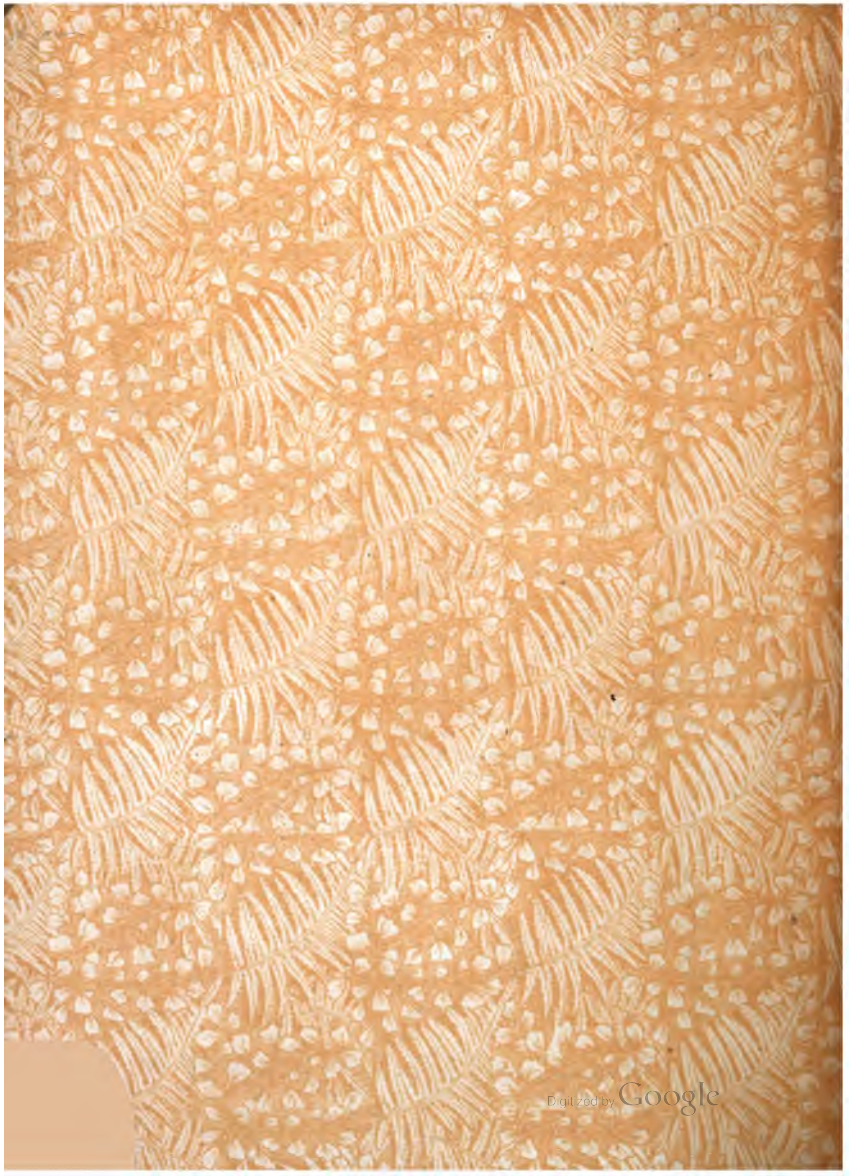
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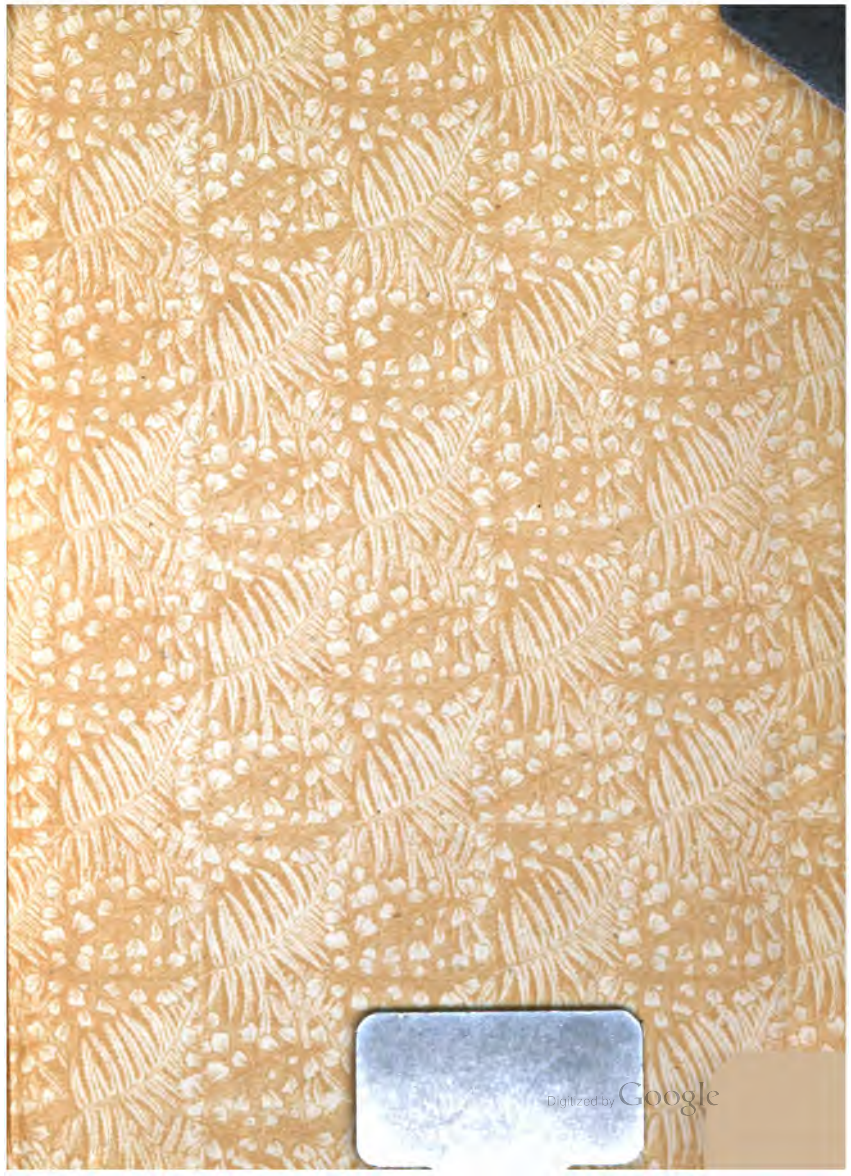
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